Learn to Use Public Health Services Data

COUNTY OF SAN DIEGO
HEALTH AND HUMAN SERVICES AGENCY
PHS
Public Health Services

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Binder Information

- Workshop I:
  - Copy of all slides presented
  - Database information sheets
  - Quick reference slides: who, what, when, where
  - Index (databases by topic)
    - For each topic/indicator, see page number for relevant databases
    - Page number of primary data sources in bold
    - i.e. want data on diabetes:
      - See databases: Hospital, ED, Death, CHIS, YRBS
- Workshop II:
  - Copy of all slides presented
  - Excerpts from online Community Profiles

Agenda

- Data - Definitions
- Asking Questions to Find Data
- Data
  - Choosing Measures
  - Analyzing
  - Interpreting
  - Presenting
- Special Considerations
- Health Indicators
- SMART Objectives
- Data Analysis Project Example
- Program Evaluation

Learning Objectives

- To understand the different ways to find and use data.
- To be able to ask the right questions about data.
- To understand the importance of planning ahead.
- To understand the basic components of a SMART objective.

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Data Basics and Definitions

Why Do We Need Data?

- Data is essential to
  - Assess and monitor health problems
  - Understand the extent of the problem
  - Identify target populations
  - Diagnose and investigate health hazards
  - Implement and evaluate educational programs
  - Develop comprehensive policies
  - Establish priorities
  - Administer community-wide services
  - Plan for emerging health issues
  - Compare to other communities, states, etc..

How We Use Data?

- Education
- Policy
- Grants
- Performance Measures
- Program Evaluation
- Prevention Activities

Quantitative vs. Qualitative Data

Quantitative:

- Collected in the form of numbers or percentages
- Closed-ended questions
- Answers who?, what?, when? and where?
- Can demonstrate cause and effect
- Can “represent” a population
- Cannot collect new ideas or responses, only those considered ahead of time

Qualitative:

- Collected in the form of words, concepts, themes, or categories
- Open-ended questions
- Answers how?, why?
- Can provide richer, more in-depth data
- Can provide data in a respondent’s own words
- Can explore new ideas in a dynamic and unstructured way

Definitions

- Population
  - The group you want to generalize to
    - Often defined in terms of demography, geography, occupation, time, care requirements, diagnosis, or some combination
  - Examples
    - All residents of San Diego County during 2005
    - All females aged 15 through 54 years living in San Diego County during 2007
- Sample
  - Subset of a population
  - Size is usually smaller than the size of the population

Types of Databases

- Population-based
  - Virtually everyone with the illness/injury is included
    - Within a specified location, i.e. State, County, Municipality
    - Meeting the database criteria
  - Inclusion varies by database
  - Examples: hospitalization, ED discharge, birth data, death data
    - Not everyone goes to the hospital or to the ED in a given time period
    - Not everyone is born or dies in a given time period
- Service or Use Data
  - Client data
    - Results apply to your service population
    - May not apply to all population with specific illness/injury
  - Examples: Alcohol & Drug Services, HIV testing, immunization,
    - Only those who seek out the service are included

Types of Databases

- Sample Data
  - Statistical sample
    - Representative of the population
    - Results can be applied to the population
  - Convenience sample
    - Not representative of the population
    - Easy to obtain
  - CHIS, YRBS
- Survey Data
  - Carefully crafted questions on a topic or issue
  - Purpose is to reveal information about community residents or the services they utilize.
  - Survey results are usually based on sample data
    - Statistical or convenience sample
    - Exception: Census data
  - CHIS, YRBS, 10-year Census

Types of Databases

- Useful Non-Health Data
  - Population Data
    - Demographic, economic, housing, land use, social characteristics
    - SANDAG, California DOF, Census
    - Useful in conjunction with public health data
      - Calculation of rates
      - Community profiles
  - Law enforcement
    - Crime data
      - ARJIS
    - Traffic crash data
      - SWITRS
  - DMV
    - Licensed drivers

What database might this person be in?

- **Useful Non-Health Data**
  - SANDAG
  - ARJIS
  - SWITRS
- **Population Data Sources**
  - Vital Records
    - Birth Certificates
    - Death Certificates
  - Medical Care Data
    - Prehospital
    - Emergency Dept
    - Trauma
    - Hospital Discharge
    - Medical Examiner
- **Service Data**
  - Behavioral Health Services
    - Alcohol and Drug
    - Mental Health Services
  - Morbidity
    - Immunization
    - HIV Testing
    - HIV/AIDS Reporting
    - STD
    - TB
    - Lead
    - Other Reportable Diseases
- **Survey (Sample) Data**
  - CHIS
  - YRBS

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Data Basics & Definitions

Finding the Right Data

Data Measures
- Choosing
- Analyzing
- Interpreting
- Presenting

Special Considerations

Health Indicators

SMART Objectives

Project Example

Program Evaluation

Asking the Right Questions to Find the Right Data

Why It's a Good Idea to Plan Ahead for Data Analyses

- To determine if the data you collect are practical for analyses
- To find available data that meets your time frame
- To review the appropriateness of your chosen data collection method(s)
- To develop the data collection instrument
- To decide if you will need help with analyses

Data Purpose

What are you trying to accomplish?

- Identify a new problem?
  - Fall injuries in kids
- Measure a known problem?
  - Heart disease hospitalizations
- Identify high-risk populations or groups?
  - Fall injuries in seniors
- Establish a measurable baseline for a specific issue or program?
  - Asthma collaborative's new intervention
- Develop a measurable objective for a specific issue or program?
  - Increase childhood immunization coverage

Who Has Data

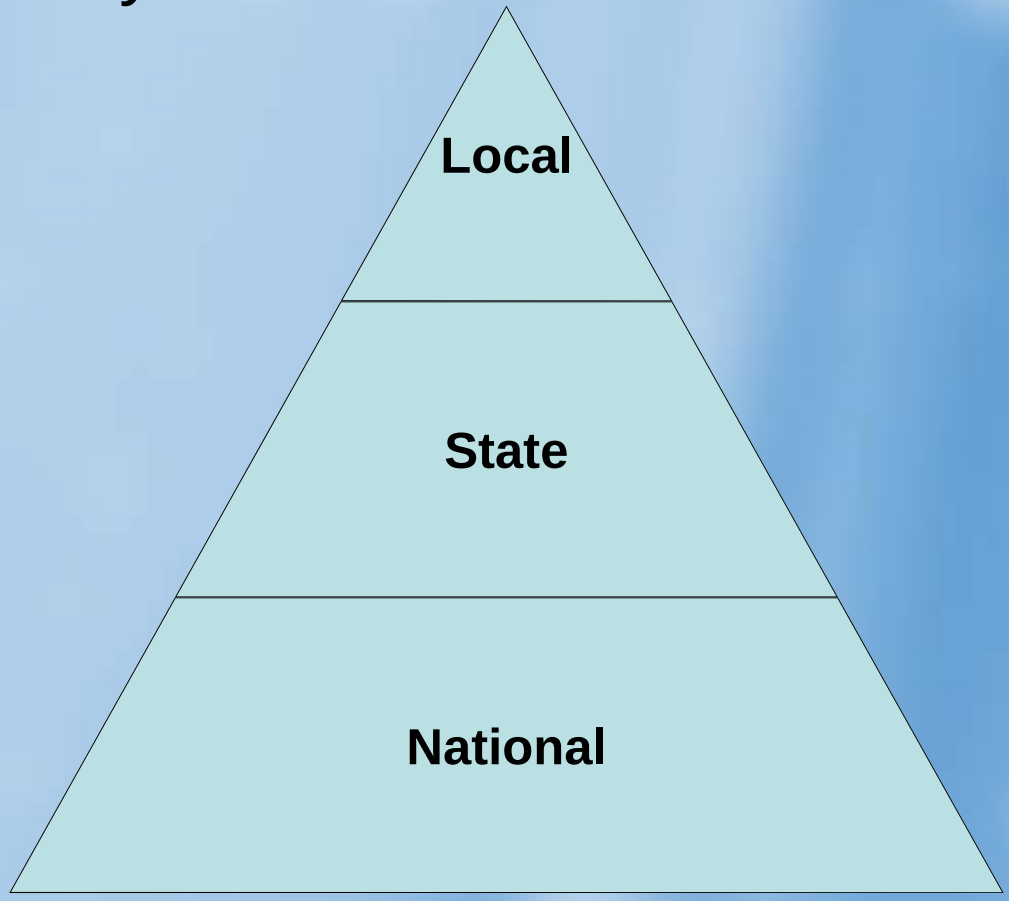
Types of data holders:

- Regulatory & government agencies
  - Local Public Health Department
  - Office of Statewide Planning & Health Development (OSHPD)
  - SANDAG (local Census)
- Research & academia
  - SDSU Center for Behavioral Epidemiology and Community Health (CBEACH)
  - CHIS/UCLA
- Service providers
  - Kaiser Foundation
  - Sharp Healthcare
- Advocacy – promotion groups
  - American Heart Association
  - Automobile Club of Southern California (AAA)
- Special interests
  - Insurance Actuaries
  - Tobacco Companies
- Marketing

Where to Find Data

Amount of data available varies by location

- Local
  - Fewer sources available
  - Local level data
- State
- National
  - More data sources
  - May not have local level data



Gathering Information

- Disease/Injury
  - Specific definition
- Age
- Gender
- Race/ethnicity
- Geographic location
- Severity
  - i.e. Death vs. Hospitalization
- Key contributing factors
  - i.e. restraint use (seat belt), medication use

Gathering Data

- Definition of Disease/Injury
  - How was this disease or injury defined?
- Time Period
  - What time period does the data represent?
- Definition of Population
  - Who does this data represent?

Go Back to Your Purpose

- Be sure to analyze only the data that will help you answer your key question(s)
- Don’t get side-tracked into analyzing other pieces of data with your limited time and resources
- It is normal to collect more data than you will need for your analysis
- You can return to any other interesting data after completing your analysis

What do you want your data to describe?

- Which data?
  - Deaths due to heart disease?
    - Death data
  - Medical encounter due to heart disease?
    - Hospital discharge
    - Emergency Department discharge
    - Prehospital
  - Prevalence information?
    - CHIS
- What measure is most appropriate?
  - Frequency (count)?
  - Percent?
  - Rate?
    - Is age adjusted more appropriate?
  - Mean or Median?
    - Do you need the “average” age?

Comparing Data

- Use caution when exploring data from multiple sources or analysts
- Important elements to consider:
  - Data source
  - Data preparation (including local vs. state level)
  - Diagnosis/case definitions
  - Rate constant (i.e., per 100,000 or per 10,000)
  - Population data source (i.e., Census vs. SANDAG vs. CA DOF)
  - Geographic unit
  - Persons included in the data:
    - Residence vs. Occurrence
    - Live births vs. Total pregnancies
    - ED discharges vs. all ED visits

Disease Diagnosis

- Disease definitions for most indicators are based on ICD-CM coding.
  - ICD-CM: International Classification of Diseases – Clinical Modification
  - Two versions currently being used
    - ICD-9
    - ICD-10
  - Caution should be used when comparing ICD-9 coded data to ICD-10
- Other indicators may be based on case definitions, meeting specific clinical and/or laboratory criteria.

ICD-9 vs. ICD-10

- ICD-9-CM
  - Used for morbidity data
  - Hospitalization, ED discharge
    - Reported by primary diagnosis at the time of discharge
    - Important to specify how your disease of interest is defined in terms of ICD-9-CM codes
- ICD-10-CM
  - Used for mortality data
  - Death data
    - Categorized only by underlying cause of death (disease or injury that initiated the chain of events)
    - Example: A diabetic who dies of heart disease resulting from complications of diabetes would only be included among diabetes-related deaths.

What disease are you asking for?

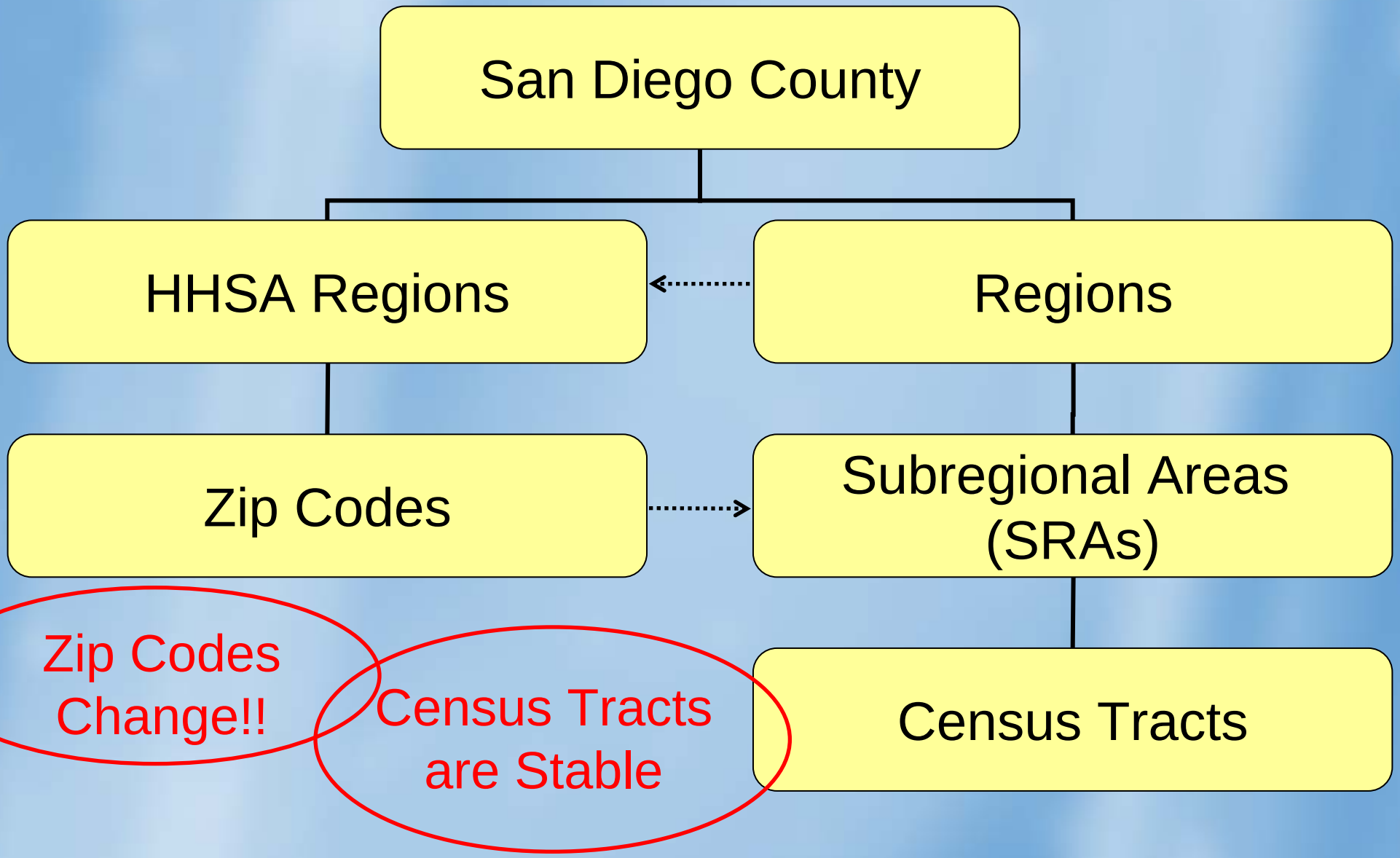
- Diseases of the Heart include (ICD-10-CM):
  - Acute rheumatic fever (I00-I02)
  - Chronic rheumatic heart diseases (I05-I09)
  - Hypertensive heart disease (I11)
  - Hypertensive renal disease (I13)
  - Ischaemic heart diseases (I20-I25)
  - Pulmonary heart disease (I26-I28)
  - Pericardium (I30-I32)
  - Endocardium (I33-I39)
  - Myocardium (I40-I41)
  - Cardiomyopathy (I42-I43)
  - Electrical conduction system of the heart (I44-I49)
  - Other (I50-I51)

"Heart Disease"

Geographic Units

- Small level geographic analysis
  - Zip code
    - Health/Service data
    - Good for service data
    - Bad for trends (changes over time)
  - Subregional Area (census tracts)
    - Population data from census
    - Bad for service data
    - Good for trends (stable over time)

Geographic Units



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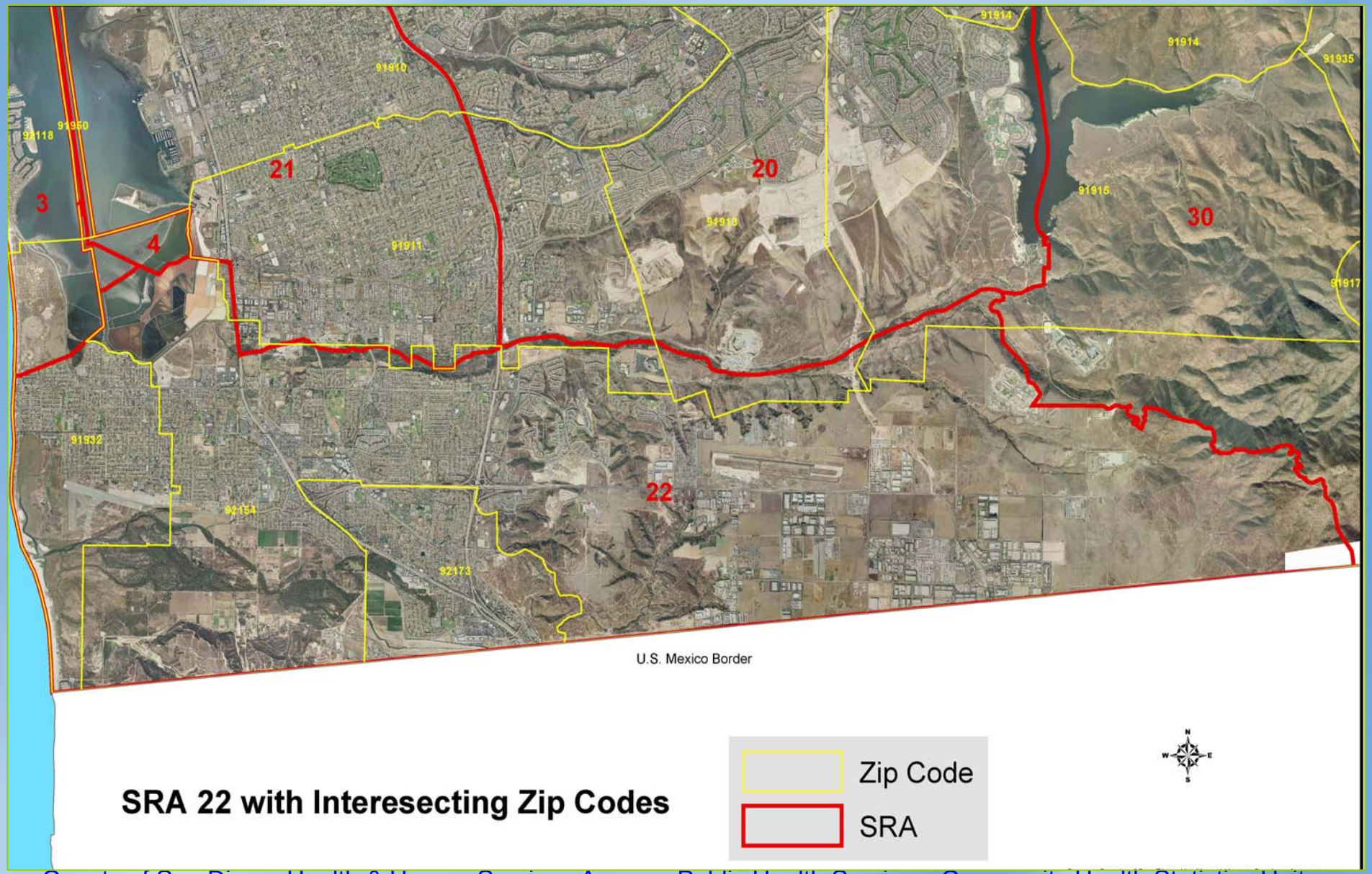
SRA vs. Zip Codes



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Choosing Measures

Choosing Measures

- Which data do you use?
  - Deaths due to heart disease?
    - Death data
  - Hospitalizations due to heart disease?
    - Hospital discharge data
  - Prevalence information?
    - CHIS
- What measure is most appropriate?
  - Frequency (count)?
  - Percent?
  - Rate?
    - Is age adjusted more appropriate?
  - Mean or Median?
    - Do you need the “average” age?

Data Measures

- Mean
  - "Average"
  - Used with continuous data
  - To calculate:
    - Add all values together
    - Divide by the number of cases
    - Example:
      - Mean age
      - 34 + 27 + 56 + 54 + 27 = 198 / 5 = 39.6 years

Data Measures

- Median
  - Middle number
  - To calculate:
    - Line values up in ascending order
    - Choose the middle number
    - If you have an even number of values, take the average of the middle two.
    - Example:
      - Median age
      - 27, 27, 34, 54, 56 = 34 years

Data Measures

- Mode
  - Most frequently occurring number
  - To calculate:
    - Line values up in ascending order
    - Choose the most commonly occurring number
    - You can have no mode or more than one mode
    - Example:
      - Mode of age
      - 27, 27, 34, 54, 56 = 27 years

Data Measures

- Range
  - The distance between the largest and the smallest numbers in the data
  - To calculate:
    - Line values up in ascending order
    - Subtract the smallest value from the largest value
    - Example:
      - Range of age
      - 27, 27, 34, 54, 56 = 56 - 27 = 29 years

Data Measures

- If you are asked, “what is the average age?”, how do you respond?
  - Average is often associated with mean, but is it the most appropriate measure?
  - Example, suppose your sample consists of 12 people of the following ages:

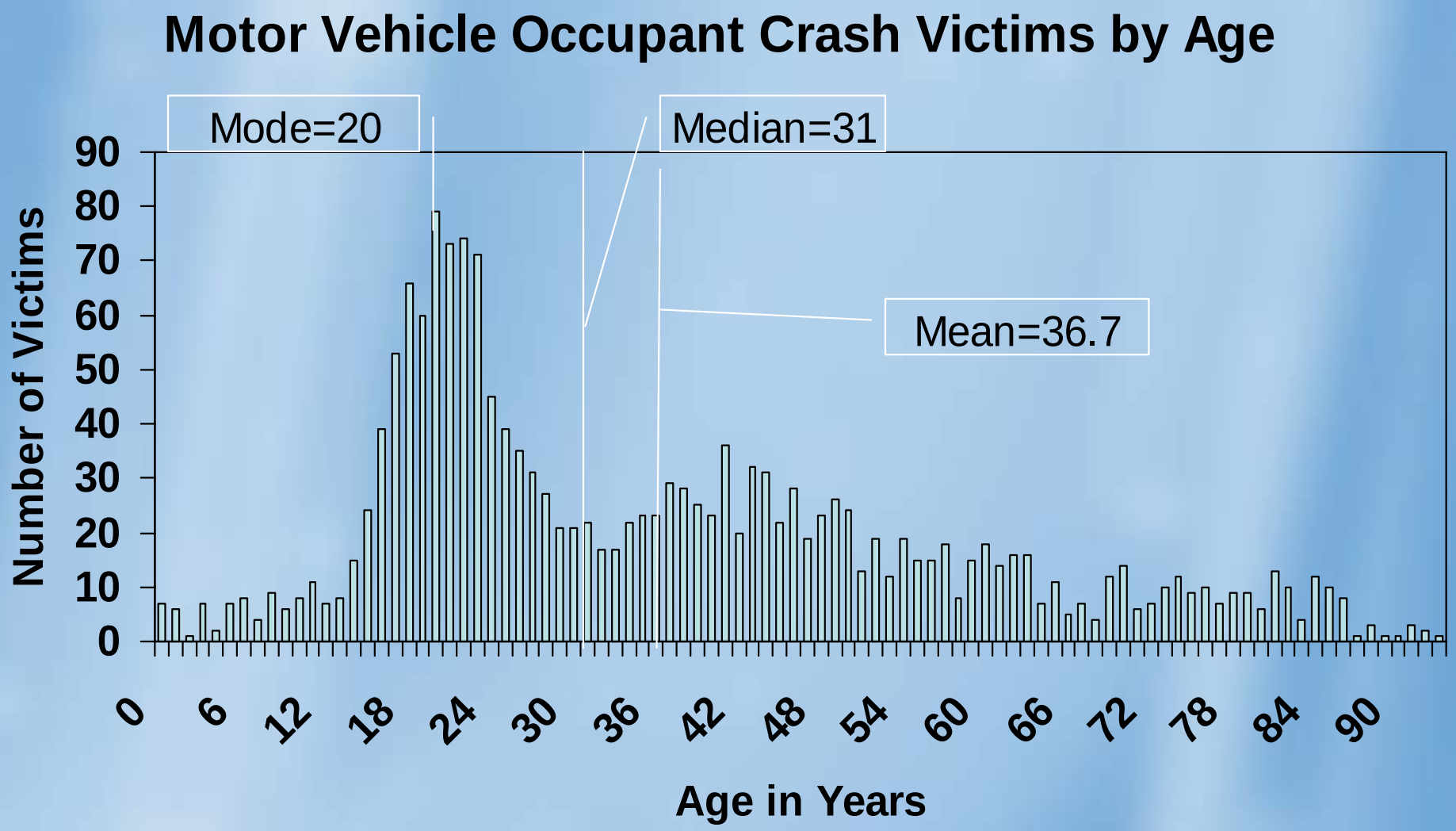
    24, 24, 25, 25, 25, 25, 25, 27, 27, 27, 29, 96

Data Measures

- 24, 24, 25, 25, 25, 25, 25, 27, 27, 27, 29, 96
  - Range: 96 – 24 = 72 years
  - Mean: 382 / 12 = 32 years
  - Median: 25 years
  - Mode: 25 years

- What measure should be used?
  - Mean is affected by outliers
    - Outlier – a value far from most others in a data set.
    - The person who is 96 years is an outlier.
  - Median and Mode are more appropriate measures of “average” age.

Mean, Median and Mode



Data Measures

- Frequency
  - A count of how many times an event occurred
  - Advantage
    - Answers the question of “how many”
  - Disadvantage
    - Cannot directly compare the number of injuries to other groups
  - Example
    - There were 369 nonfatal hospitalizations for pedestrian injuries in San Diego County in 2004

Data Measures

- Percentage
  - Represents the proportion of cases out of 100
    - Total will add to 100%
  - Advantage
    - Describes the frequency by group within a whole
  - Disadvantage
    - Does not tell how many
    - Does not control for population size, so can't compare to other populations or over time
  - Equation
    - Percent = $\frac{\text{\# in group}}{\text{total \#}} \times 100$
  - Example:
    - $\frac{\text{129 HIV+ tests to Whites}}{\text{290 total HIV+ tests}} = 0.445 \times 100 = 44.5\%$

Data Measures

- Rate
  - Frequencies that have been converted to proportions sharing a common denominator
  - Advantage
    - Is a standardized measure
    - Easier to compare disease frequency across different populations and time periods.
  - Disadvantage
    - Does not tell how many
  - Equation
    - Rate = $\frac{\text{\# illness/events in a specific population}}{\text{total \# of specific population}} \times \text{Constant}$

      Constant = 1000, 10,000 or 100,000
  - Example
    - $\frac{\text{196 AIDS cases for Whites}}{\text{1,577,029 Whites in population}} \times 100{,}000 = 12.4 \text{ per } 100{,}000$

Data Measures

- Types of rates
  - Actual rate
    - A rate that applies to the population as a whole
  - Age-specific rate
    - An actual rate measured within a specific age group
  - Age-adjusted rate
    - A rate that is standardized to a distribution of the population by age group

Break

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Rate Calculations

- Fall hospitalizations in Healthy County, 2001
  - 0-4 yr olds: 250 per 180,000 population
  - 5-9 yr olds: 240 per 165,000 population

- Calculating only the proportion is hard to interpret:

$$\frac{250}{180{,}000} = 0.0013889$$

$$\frac{240}{165{,}000} = 0.0014545$$

- Need to convert to “events per a common population”

Rate Calculations

- Three components:
  - Number of injuries per time period (numerator)
    - 250 fall hospitalizations in 2001 among 0-4 year olds
    - 240 fall hospitalizations in 2001 among 5-9 year olds
  - Size of the population (denominator)
    - 180,000 0-4 year olds in 2001
    - 165,000 5-9 year olds in 2001
  - Constant
    - usually 100,000 for public health data
    - often 1,000 for birth-related data

Rate Calculations

- Rate Formula

  $$\frac{\text{\# of events in the population per time period}}{\text{\# of people in the population per time period}} \times \text{Constant}$$

- Example

$$\frac{\text{Number of hospitalizations due to falls, 0-4 yrs, 2001}}{\text{Total population, 0-4 yrs, 2001}} \times 100{,}000 = \frac{250}{180{,}000} \times 100{,}000 = 138.9 \text{ per } 100{,}000$$

$$\frac{\text{Number of hospitalizations due to falls, 5-9 yrs, 2001}}{\text{Total population, 5-9 yrs, 2001}} \times 100{,}000 = \frac{240}{165{,}000} \times 100{,}000 = 145.5 \text{ per } 100{,}000$$

Rate Interpretation

- The interpretation of a rate can be written in multiple ways:
  - For every 100,000 children aged 0-4 years in Healthy County, 139 were hospitalized due to a fall injury in 2001.
  - The rate of hospitalization due to falls among 0-4 year olds was 138.9 per 100,000 in 2001.
  - In 2001, there were 139 hospitalizations due to falls per 100,000 children ages 0-4 years in Healthy County.

Data Measures

- Percentage Rate
  - Represents the proportion of cases per 100 (will not add up to 100)
    - Rate per 100 (instead of typical 100,000)
  - Advantage
    - Is a standardized measure
    - Can compare disease frequency across different populations and time periods
  - Disadvantage
    - Does not tell how many
    - Difficult to compare for large populations with small numbers of events
  - Equation
    - Percent rate = $\frac{\text{\# illness/events in a specific population}}{\text{total \# of specific population}} \times 100$
  - Example:
    - $\frac{\text{129 HIV+ tests to Whites}}{\text{7,197 total HIV tests to Whites}} = 0.018 \times 100 = 1.8\%$

Frequency, Percent or Rate?

- Frequency tells you how many (shows magnitude)
  - i.e. From 2000 through 2004 in San Diego County, 30 children aged 0 to 4 years died as the result of drowning.
- Percents tell you a proportion of the whole.
  - i.e. From 2000 through 2004 in San Diego County, 47% of deaths due to unintentional injury among 0 to 4 year olds were the result of drowning.
- Rates tell you how many per a given population and allow you to compare year to year or group to group.
  - i.e. From 2000 through 2004 in San Diego County, the rate of drowning deaths among 0 to 4 year olds was 2.9 per 100,000, compared to 2.6 per 100,000 in Spring County during the same time period.

Frequencies, Percents, Rates

Cancer Deaths, San Diego County	1994	2004
Count	4,375	4,733
Percent	0.17%	0.16%
Total Population	2,610,994	3,024,720
Crude Rate*	167.6	156.5 (6.6% decrease)
Age-Adjusted Rate*	206.7	173.9 (15.9% decrease)

*Rates per 100,000 population

Frequency or Rate?

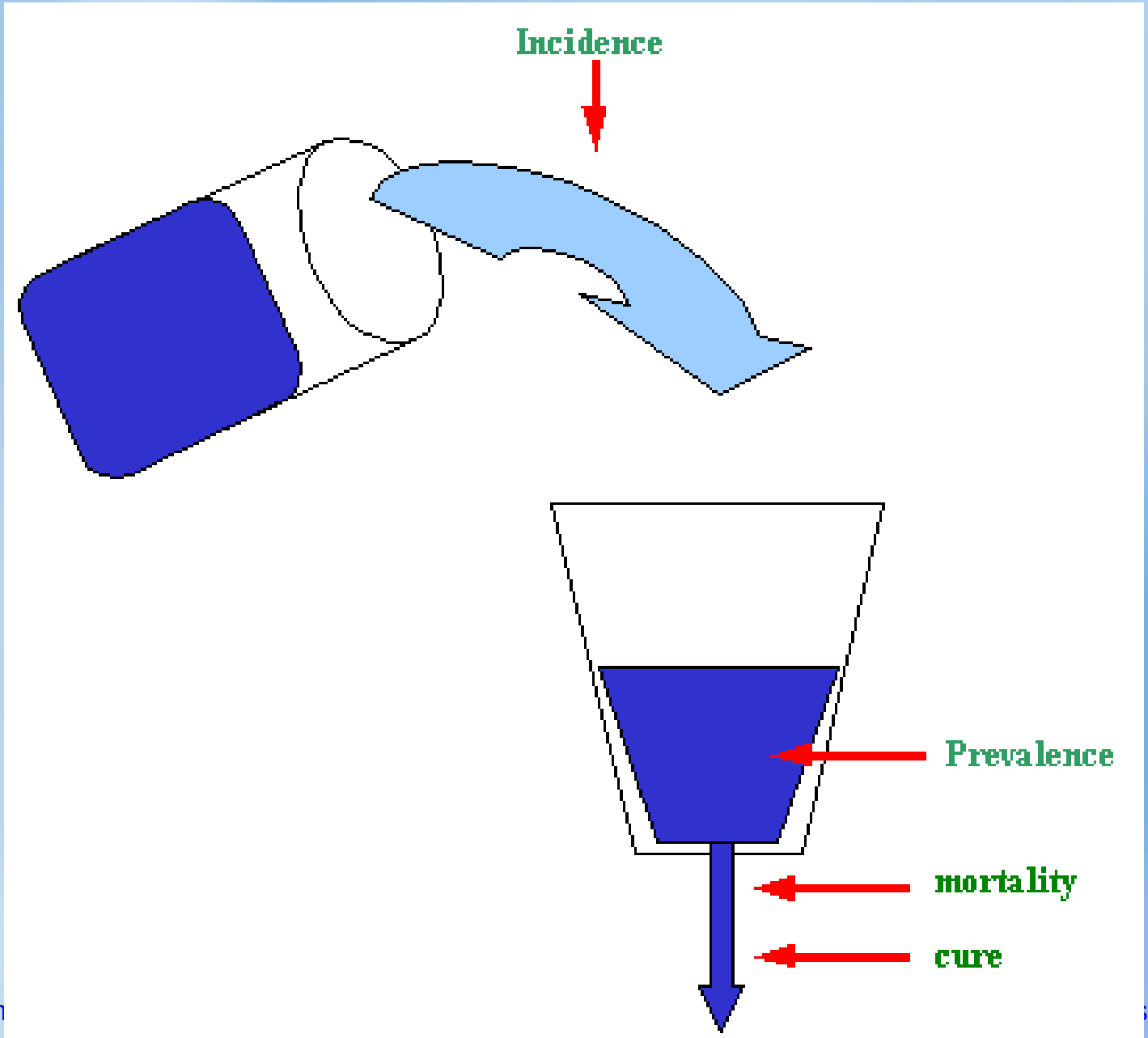
- Which County has a greater need for motor vehicle safety interventions?
  - Number of deaths:
    - Summer County: 800 deaths due to MVC
    - Winter County: 500 deaths due to MVC
  - County populations:
    - Summer County: 2,000,000 people
    - Winter County: 800,000 people
  - Rate of MV deaths:
    - Summer County: 40.0 per 100,000
    - Winter County: 62.5 per 100,000

Definitions

- Incidence
  - The number of *new* events in a given population during a given time
  - Where we get incidence data: legally reportable disease (new cases), medical service encounters, survey.
  - i.e. “In ___(year), there were ___(number) of new cases of ___(disease)”.
    - Example: A total of 27 women were diagnosed with breast cancer in Healthy County in 2005.

- Prevalence
  - The total number of persons with a given condition at a given time
  - Where we get prevalence data: disease registry, survey, legally reportable disease (usually a disease that lasts, not acute episode)
  - i.e. “In ___(year) there were ___(number) of people with ___(disease)”
    - Example: A total of 213 women were living with breast cancer in Healthy County in 2005.

Relationship Between Incidence and Prevalence



Incidence or Prevalence?

- Example 1:
  - Based on the results of a local survey, in 2006 there were 367 persons ages 65 years and older living in Spring County who were survivors of a broken hip.
  - In 2006, 32 people aged 65+ years were hospitalized due to a broken hip.
- Example 2:
  - CHIS (2005) estimates that 16% of Spring County children aged 0 to 17 years have been diagnosed with asthma by a healthcare provider during their lifetime.
  - A survey of local physicians estimates that 246 children aged 0 to 17 years were diagnosed with asthma in 2005.

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Analyzing Data

Analyzing Data

- Determine how you want to use the data
  - Compare averages, frequencies, percentages, rates
  - Compare data from different populations
    - County vs. County
    - County vs. State
    - State vs. US
  - Compare data from different segments of a population
    - Male vs. female
    - African American, white, Latino, Asian, American Indian, etc.
    - Children, teens, adults, seniors
    - Clientele of your program vs. those who are not
    - Different income or health insurance levels
    - Married vs. single
    - Smokers vs. not

Types of Rates

- Actual rates
  - Magnitude
  - Program/resource planning
- Specific rates (rate for each age group)
  - Magnitude
  - Program/resource planning
- Age adjusted rates (rate based on theoretical population with same age distribution)
  - Comparing non-age related risk in populations
  - e.g. local vs. national

Example 1: Target Specific Groups

Fall-related† Hospitalizations Among San Diego County Residents by Location of Residence, 2005 Detail

	North Coastal Rate*	North Central Rate*	Central Rate*	South Rate*	East Rate*	North Inland Rate*	County Rate*	County Age-Adjusted Rate*
Total**	191.2	188.1	180.2	182.7	239.6	207.6	200.9	209.7
Gender								
Male	152.8	160.5	172.2	161.2	200.0	173.3	172.4	166.7
Female	230.7	216.0	188.4	204.8	277.2	240.7	229.6	283.7
Race/Ethnicity								
White	257.5	242.2	334.5	310.4	297.4	284.5	282.9	227.3
Black	56.2	87.7	137.3	93.0	113.6	75.5	111.9	153.6
Hispanic	81.2	122.2	122.5	138.8	138.3	87.5	117.6	191.7
API/Other	138.7	77.4	104.0	152.2	109.4	110.9	110.4	72.0
Age Group								
0-14	82.9	72.6	90.2	100.4	84.6	103.6	89.8	
15-24	55.9	80.5	70.8	45.6	54.3	59.9	62.2	
25-64	78.3	73.2	111.4	88.7	124.0	84.8	94.3	
65+	1,093.2	1,034.6	1,058.8	1,070.5	1,286.3	1,071.6	1,116.1	

Source: Hospital Discharge Data, (CA OSHPD), CoSD, HHSA,, Comm Epi; SANDAG, Current Pop Est, 9/27/2006.

Example 2: Plan Resources

Fall-related† Hospitalizations Among San Diego County Residents by Location of Residence, 2005 Detail

	North Coastal Rate*	North Central Rate*	Central Rate*	South Rate*	East Rate*	North Inland Rate*	County Rate*	County Age-Adjusted Rate*
Total**	191.2	188.1	180.2	182.7	239.6	207.6	200.9	209.7
Gender								
Male	152.8	160.5	172.2	161.2	200.0	173.3	172.4	166.7
Female	230.7	216.0	188.4	204.8	277.2	240.7	229.6	283.7
Race/Ethnicity								
White	257.5	242.2	334.5	310.4	297.4	284.5	282.9	227.3
Black	56.2	87.7	137.3	93.0	113.6	75.5	111.9	153.6
Hispanic	81.2	122.2	122.5	138.8	138.3	87.5	117.6	191.7
API/Other	138.7	77.4	104.0	152.2	109.4	110.9	110.4	72.0
Age Group								
0-14	82.9	72.6	90.2	100.4	84.6	103.6	89.8	
15-24	55.9	80.5	70.8	45.6	54.3	59.9	62.2	
25-64	78.3	73.2	111.4	88.7	124.0	84.8	94.3	
65+	1,093.2	1,034.6	1,058.8	1,070.5	1,286.3	1,071.6	1,116.1	

Source: Hospital Discharge Data, (CA OSHPD), CoSD, HHSA,, Comm Epi; SANDAG, Current Pop Est, 9/27/2006.

Example 3: Local, State & National comparisons

Coronary Heart Disease† Deaths					
	San Diego County		California	U.S.A.	Healthy People 2010 Target
Year	actual rate	age-adjusted rate‡	age-adjusted rate‡	age-adjusted rate‡	age-adjusted rate‡
2003	140.7	155.1	178.0	172.0	162.0

Rates per 100,000 population. County and other age-adjusted rates per 100,000 2000 US standard population.

† Coronary Heart Disease death refers to (underlying cause of death) ICD-10 codes I11, I20-I25.

‡ Source: National Vital Statistics System, CDC, NCHS. Online database accessed 12/20/2006: http://wonder.cdc.gov/data2010/source.htm

Source: Death Statistical Master Files (CA DPH), County of San Diego, Health & Human Services Agency, Community Epidemiology; SANDAG, Current Population Estimates, 9/27/2006.

Prepared by County of San Diego (CoSD), Health & Human Services Agency (HHSA), Community Health Statistics, 12/12/2006.

Analyzing Data

- Keep in mind what other info you may need to understand why differences
  - Demographics
    - population age distribution
  - Economics
    - poverty level
  - other health outcome data or access data

Good Enough

What to do when you don't have the exact data?

Example: Diabetes Mortality Data

- Healthy People 2010: multiple causes, including diabetes as a contributing cause
- Target: 46 per 100,000 age-adjusted population

- San Diego County data: underlying cause only
- 2004: 19.4 per 100,000 age-adjusted population
- *note: local data is based on single cause only, the rate for multiple cause death would be expected to be higher than the rate here

Trends

- Year 2000: 25
- Year 2005: 35

- Percentage point increase
  - Formula: new value – original value
  - 35-25 = increased 10 percentage points
- Percent increase
  - formula: (new value-original value)/original value
  - (35-25)/25 * 100 = 40% increase

Statistical Significance

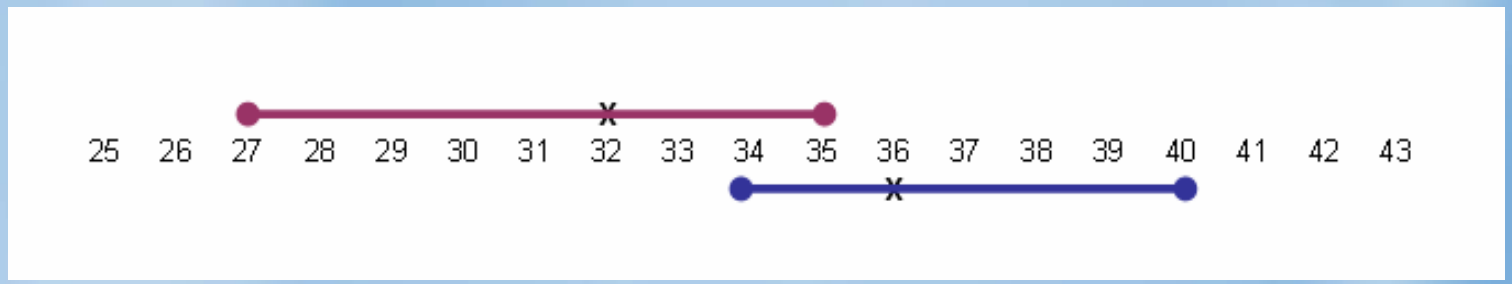
- Determining statistical significance
  - All health data has inherent variability from year to year
    - Variability is based mostly on number of events
    - Are the differences due to chance?
  - A small number of events increases the variability
    - What is a small number of events?
  - Two Methods
    - 95% confidence intervals (95% CI)
    - P-values

95% Confidence Intervals

- 95% CI means you can be 95% sure that the true rate for that population falls within that range
  - If CIs for the groups being compared overlap, the rates are not likely to be different,
  - If they don't overlap, they are likely different

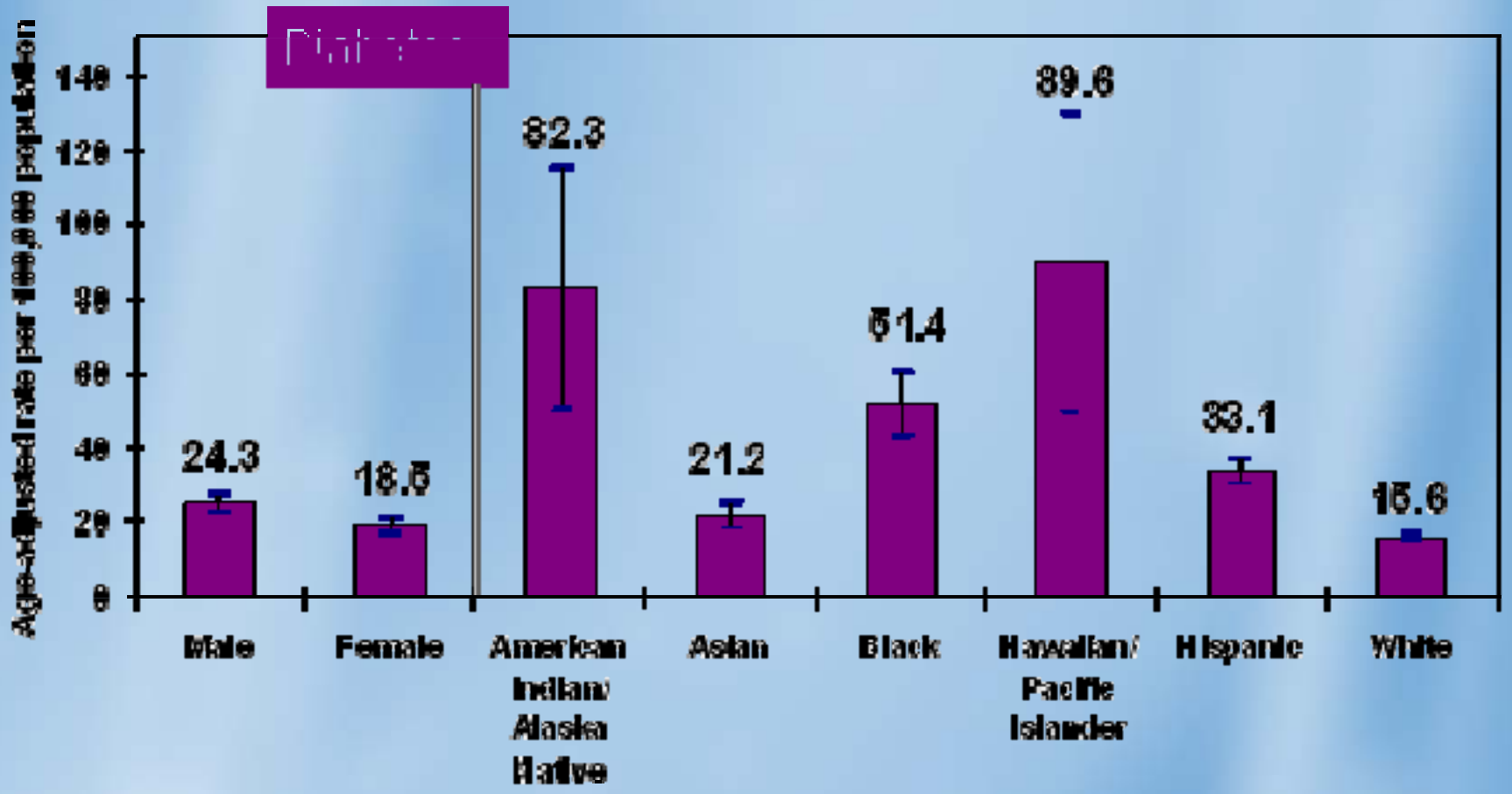
95% CI – Example 1

- Example: The mean age of all females who completed the health survey was 32 years (95% CI 27 – 35), and the mean age of males was 36 years (95% CI 34 – 40). Is the mean age significantly different between females and males?



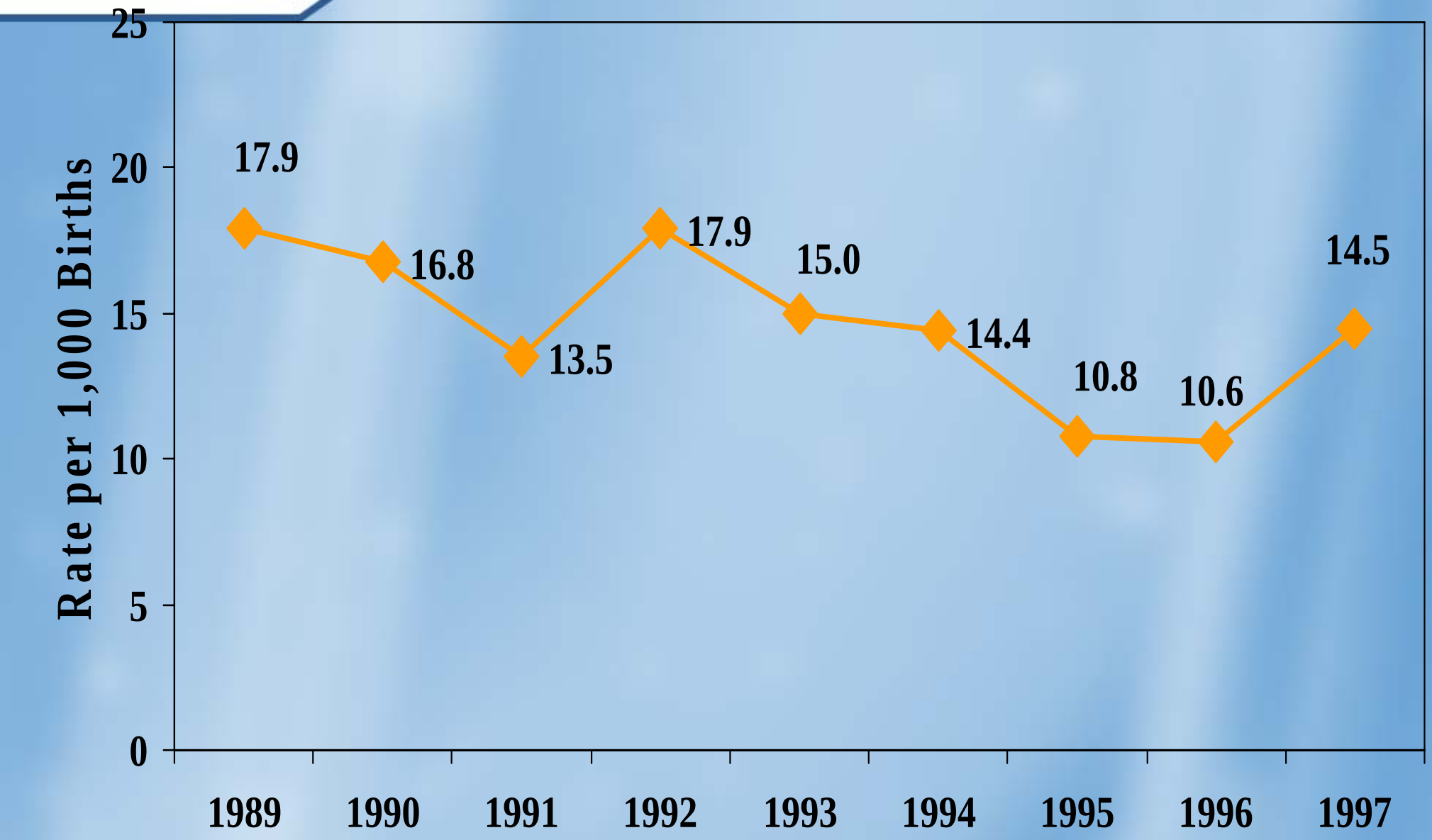
95% CI – Example 2

San Diego County Age-adjusted Death Rates by Gender 2005 and Race/Ethnicity 2003-2005 (pooled)



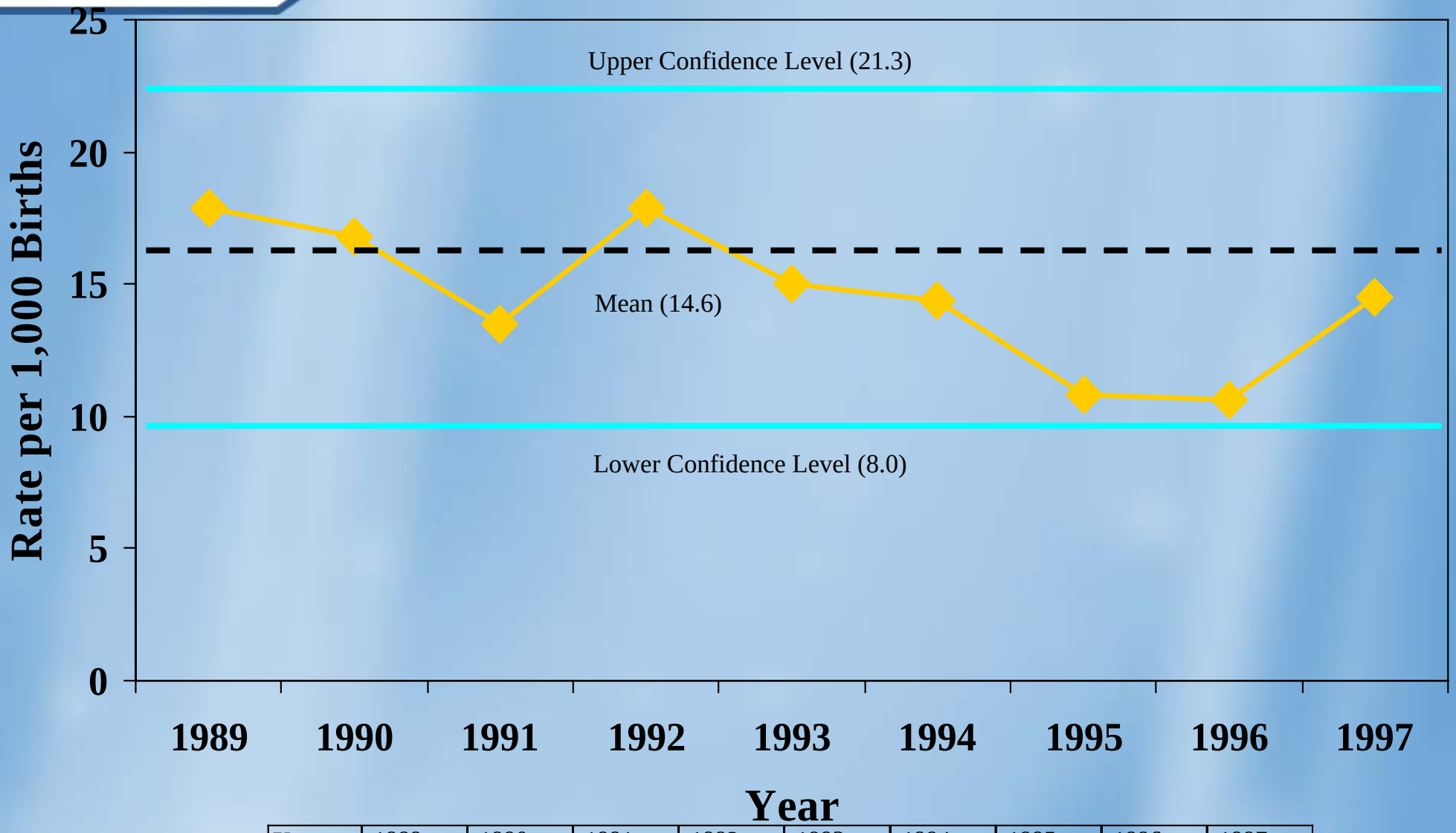
Source: California Department of Public Health, Center for Health Statistics, Death Statistical Master Files, 2003-2005; SANDAG January 1 population estimates (2004-2005 estimates released 2007; 2003 estimates released 2006). Prepared by County of San Diego, Health and Human Services Agency, Public Health Services, Community Epidemiology Branch 2008.

Black Infant Mortality Rate: 1989-1997 San Diego County



Source: CA, DHS, Center for Health Statistics, Birth & Death Statistical Master Files. CoSD, HHSA, MCFHS, 1989-1997.

Black Infant Mortality Rate: 1989-1997 San Diego County



Year	1989	1990	1991	1992	1993	1994	1995	1996	1997
Rate	17.9	16.8	13.5	17.9	15.0	14.4	10.8	10.6	14.5

P-Values

- A p-value of 0.05 means a 5% probability that the observed difference occurred by chance
  - p = 0.05 is most often used, but you may also see p = 0.10 or p = 0.01
    - What does p = 0.10 mean?
    - What does p = 0.01 mean?
  - Generally used with survey or research data
  - Generated by t-test, z-test, ANOVA, etc.

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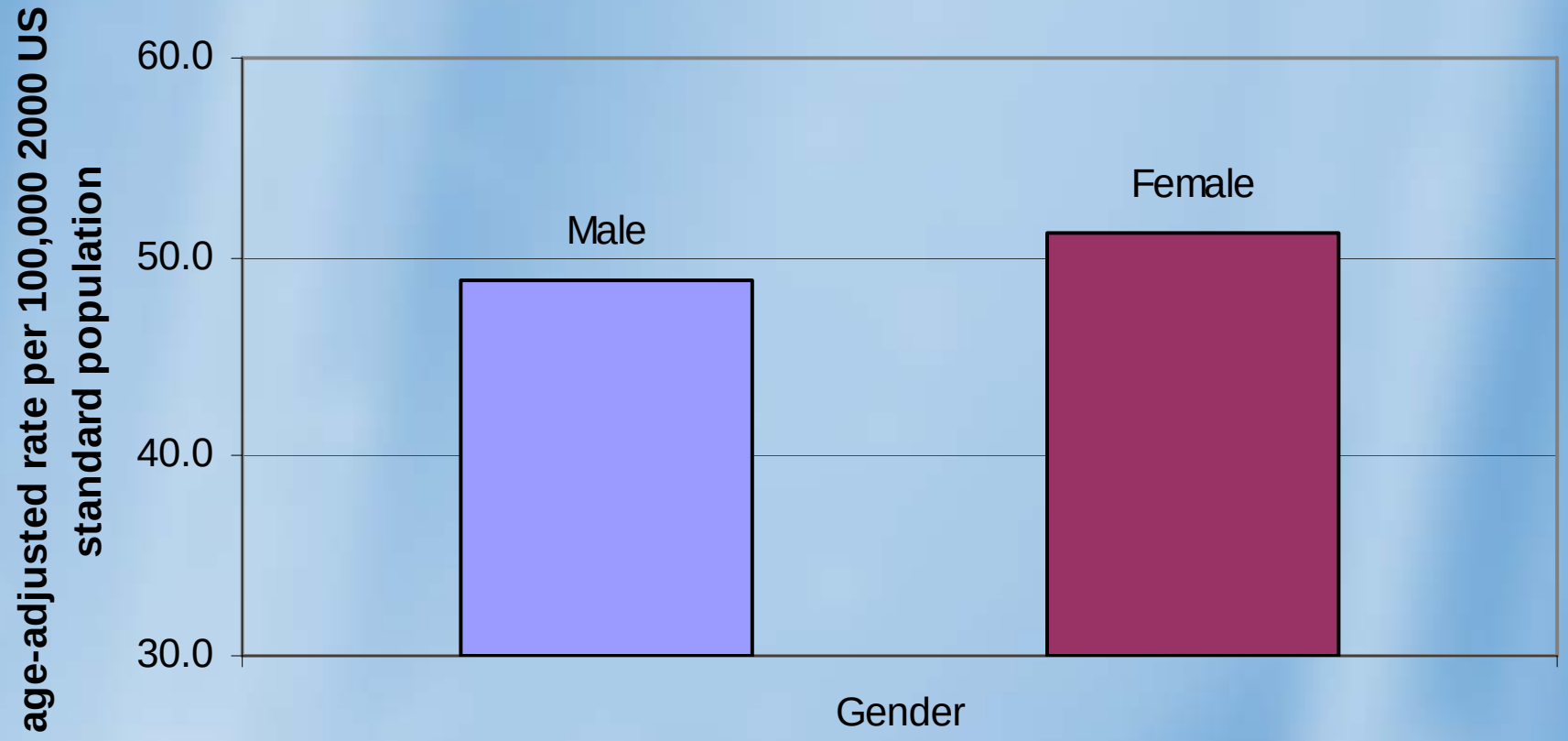
Interpreting Data

Interpretation of Data

- Important questions to consider
  - Interesting results?
  - Interesting patterns or relationships?
  - Changes over time?
- Which measure do we use?
  - Mean, Median, Mode?
  - Frequency?
  - Percentage?
  - Rates?

Stroke Death: Age-adjusted Rates by Gender

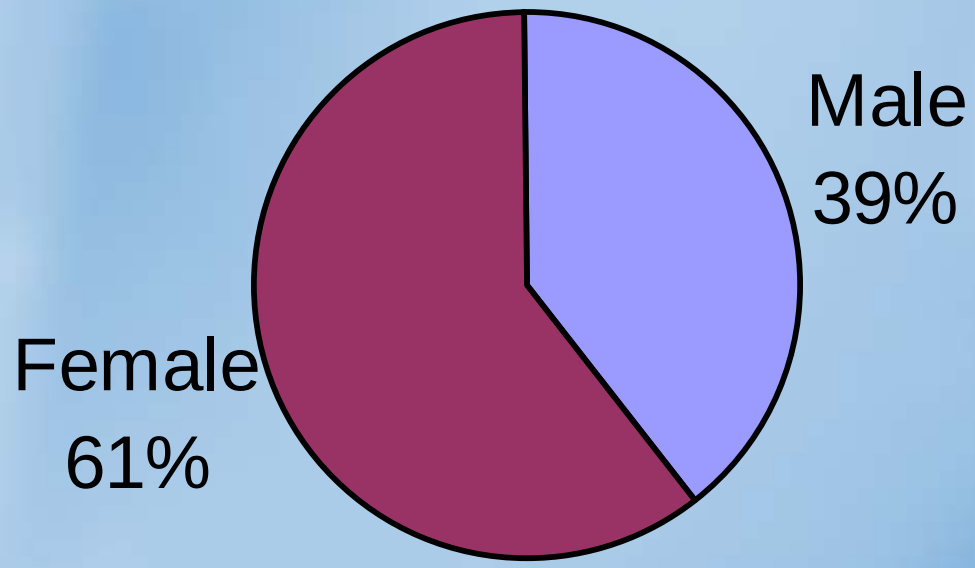
Stroke Deaths, Age-adjusted Rates, San Diego County, 2004



Source: Death Statistical Master Files (CA DHS), County of San Diego (CoSD), Health & Human Services Agency (HHSA), Community Epidemiology; SANDAG, Current Population Estimates, 9/27/2006. Prepared by CoSD, HHSA, Community Health Statistics, 8/27/2007.

Stroke Death: Percent by Gender

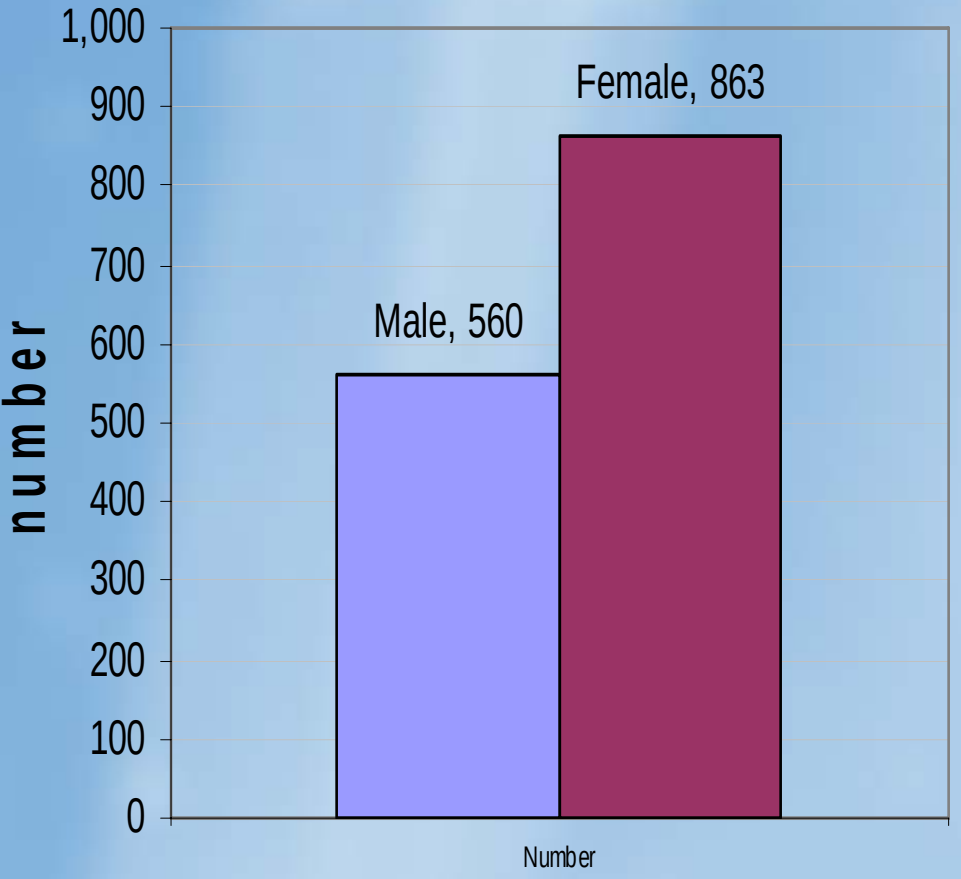
Percent of Stroke Deaths by Gender, San Diego County, 2004

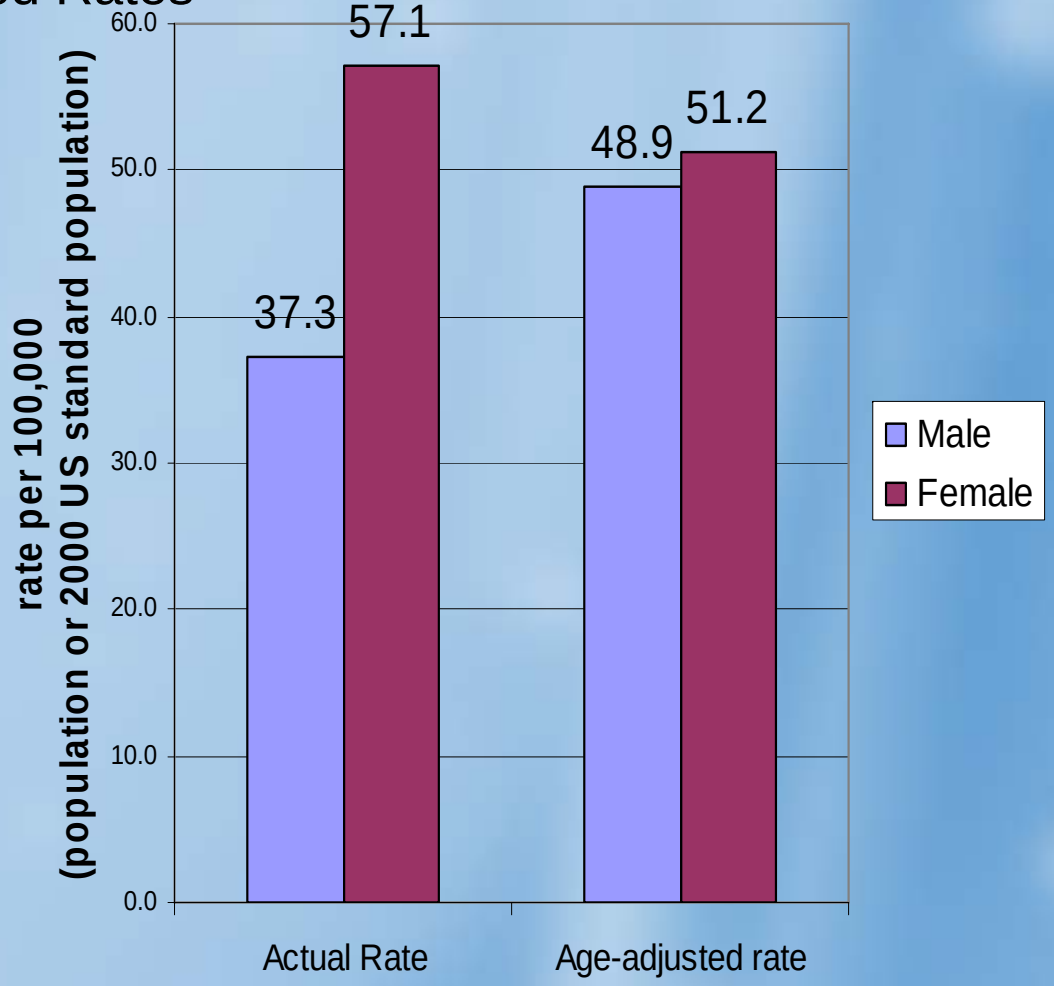


Source: Death Statistical Master Files (CA DHS), County of San Diego (CoSD), Health & Human Services Agency (HHSA), Community Epidemiology; SANDAG, Current Population Estimates, 9/27/2006. Prepared by CoSD, HHSA, Community Health Statistics, 8/27/2007.

Stroke Death by Gender, San Diego County 2004

Numbers, Actual Rates, Age-adjusted Rates





Source: Death Statistical Master Files (CA DHS), County of San Diego (CoSD), Health & Human Services Agency (HHSA), Community Epidemiology; SANDAG, Current Population Estimates, 9/27/2006. Prepared by CoSD, HHSA, Community Health Statistics, 8/27/2007.

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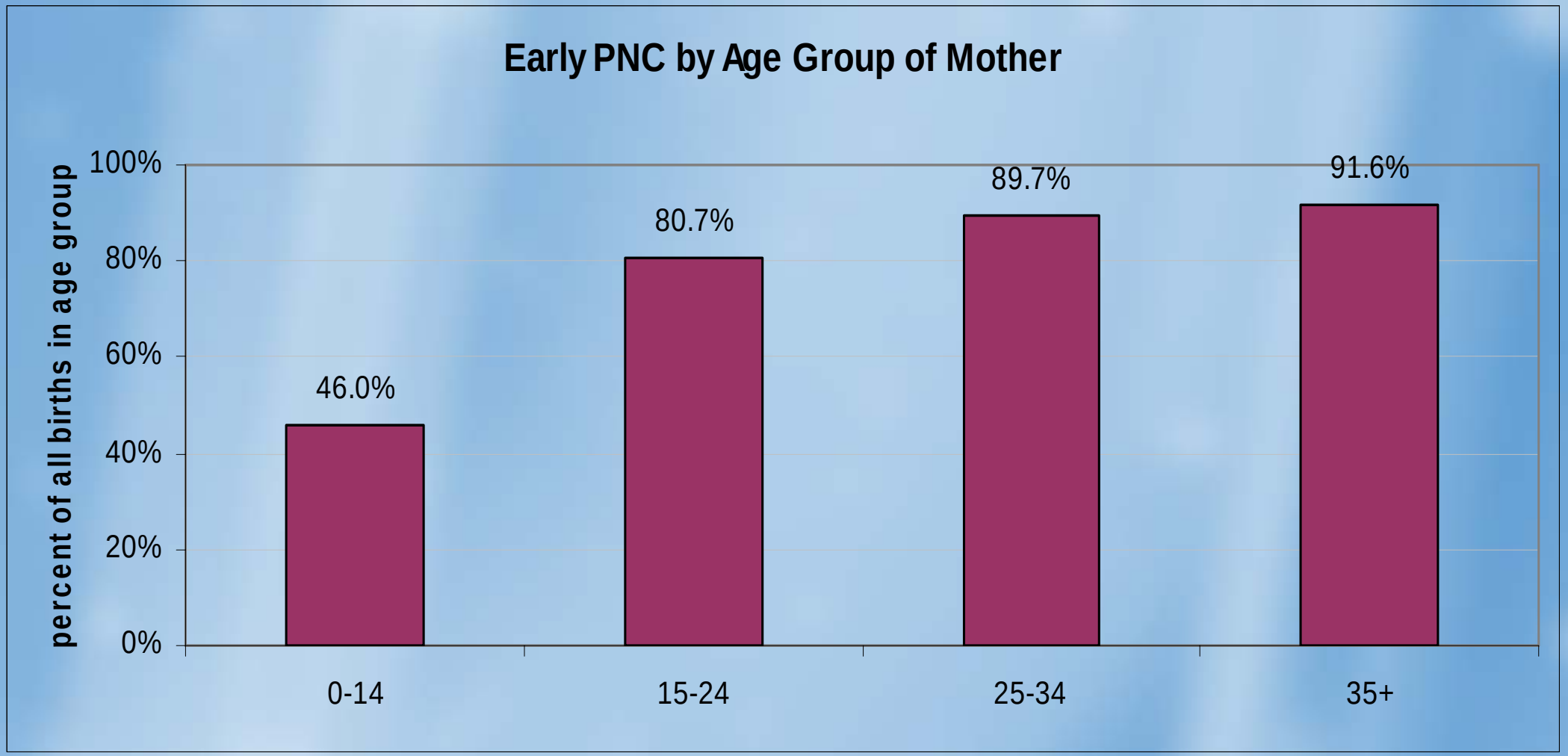
Percent of Births Where Mother Received Early Prenatal Care, San Diego, 2005



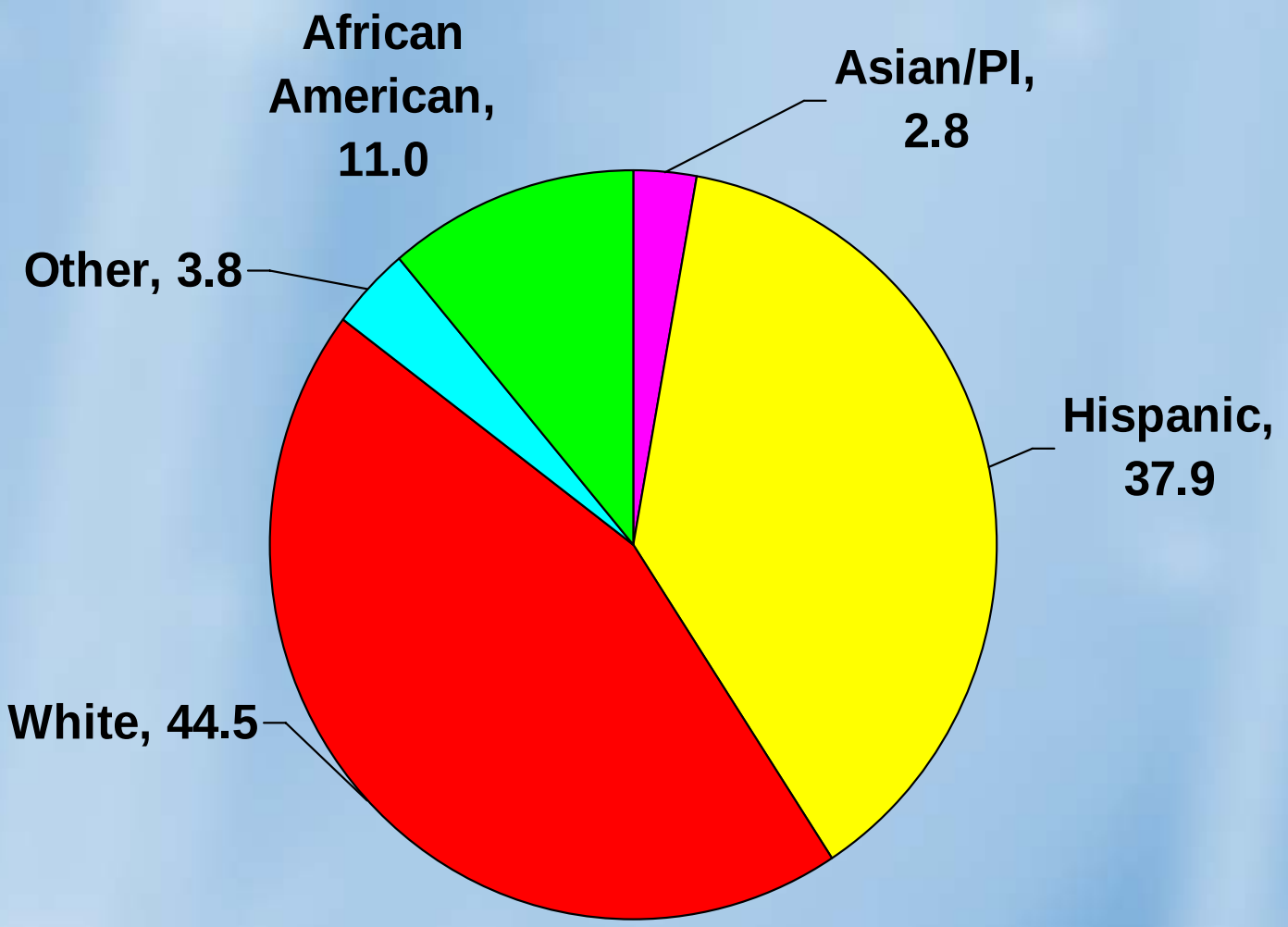
Source: CA, DHS, Center for Health Statistics, Birth Statistical Master Files. County of San Diego, Health & Human Services Agency, Maternal, Child and Family Health Services. Prepared by CoSD, HHSA, Community Health Statistics, 8/27/2007.

Early Prenatal Care by Age Group, San Diego County, 2005

Age Group of Mother (yrs)	Early PNC Number	Known PNC Number	% Early PNC
0-14	23	57	46.0%
15-24	11,154	13,889	80.7%
25-34	20,885	22,311	89.7%
35+	7,240	7,085	91.6%

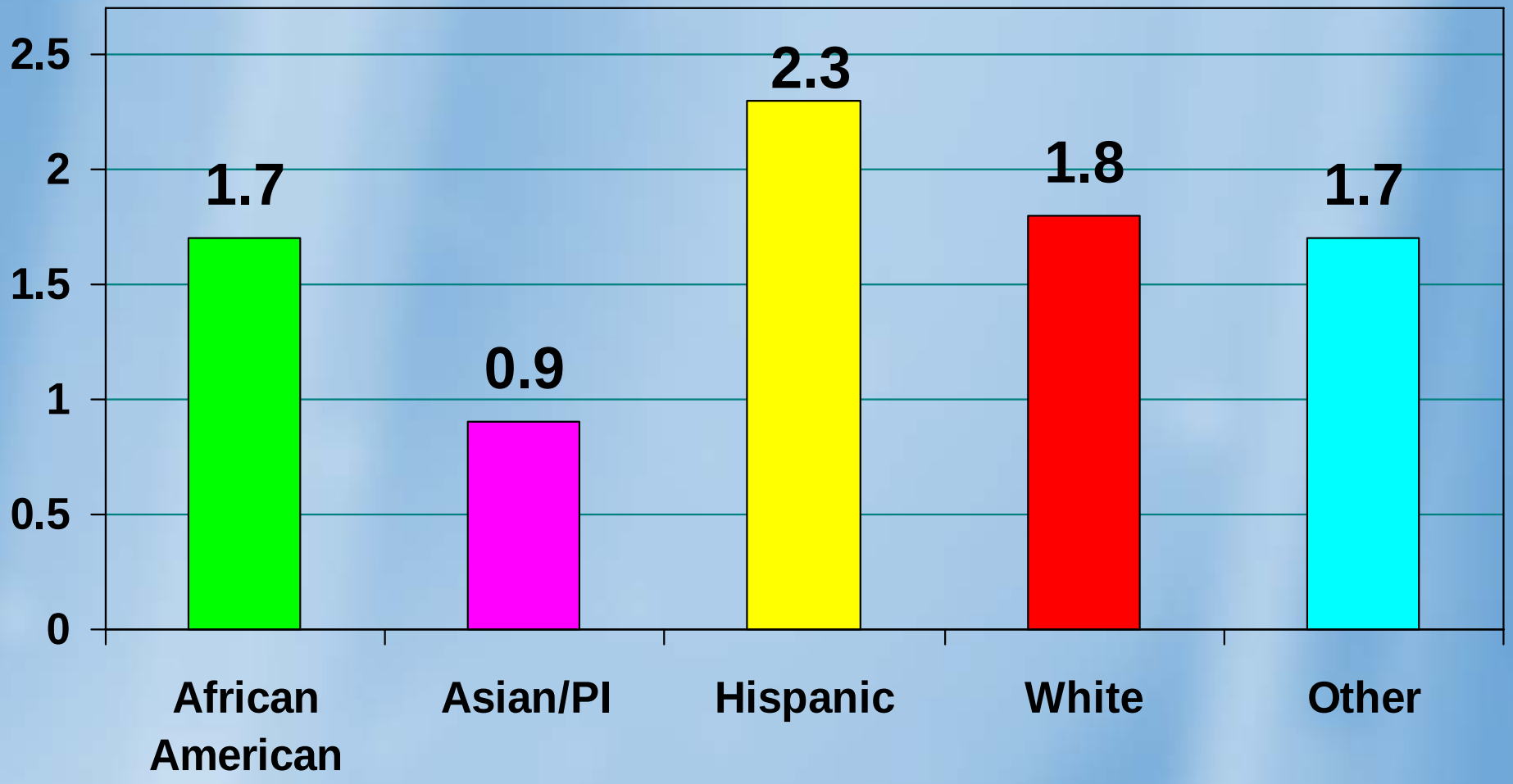
Source: CA, DHS, Center for Health Statistics, Birth Statistical Master Files. County of San Diego, Health & Human Services Agency, Maternal, Child and Family Health Services. Prepared by CoSD, HHSA, Community Health Statistics, 8/27/2007.

Percent of HIV + Tests by Race/Ethnicity, San Diego County, 2003



Source: County of San Diego, Health & Human Services Agency, HIV/AIDS Epidemiology Unit, 2003.

Rate of HIV+, per 100 tests by Race/Ethnicity, San Diego County, 2003



Source: County of San Diego, Health & Human Services Agency, HIV/AIDS Epidemiology Unit, 2003.

HIV+ Number and Rate by Race/Ethnicity, San Diego County, 2003

Race/ Ethnicity	HIV+ Tests	Total Tests	Rate HIV+ per 100 total tests	95% CI
African American	32	1931	1.7	1.1 – 2.3
Asian/PI	8	884	0.9	0.4 – 1.8
Hispanic	110	4791	2.3	1.9 – 2.7
White	129	7197	1.8	1.5 – 2.1
Other	11	653	1.7	0.8 – 3.0
Total	290	15,456	1.9	1.7 – 2.1

Source: County of San Diego, Health & Human Services Agency, HIV/AIDS Epidemiology Unit, 2003.

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Presenting Results

Presenting Results

- What is your message?
  "Hispanics in San Diego County have the highest rate of HIV+ tests…"
  - "…therefore we need to target our educational outreach in the Hispanic community"
  - "…therefore we need additional funding to provide treatment for this community"
- Who is your audience?
  - General public
  - Medical personnel & outreach workers
  - Program allocations/planning

Presenting Results

- What is your message?

  "Child pedestrians are at risk of injury around their schools…"

  – "…therefore we need a traffic light"

  – "…therefore we need to teach them to be safer pedestrians"

- Who is your audience?

  – Traffic engineering department

  – PTA, school

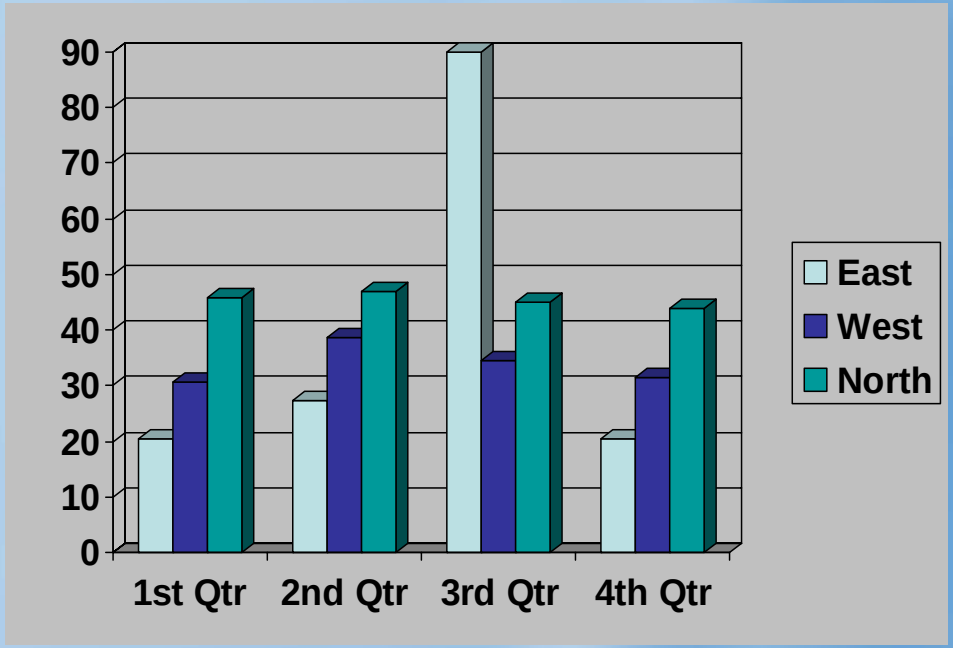
Presenting Results

How do you reach your intended audience?

- Use units familiar to audience
  - Example: during 1 episode of Law & Order, 11 people in California will go to ED & be discharged with an assault injury
  - Example: At 70mph you need more than a football field to stop your car

Presenting Results

- Ways to present information
  - Table
  - Chart / Graph
  - Narrative



	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
East	20.4	27.4	90	20.4
West	30.6	38.6	34.6	31.6
North	45.9	46.9	45	43.9

Presenting Results

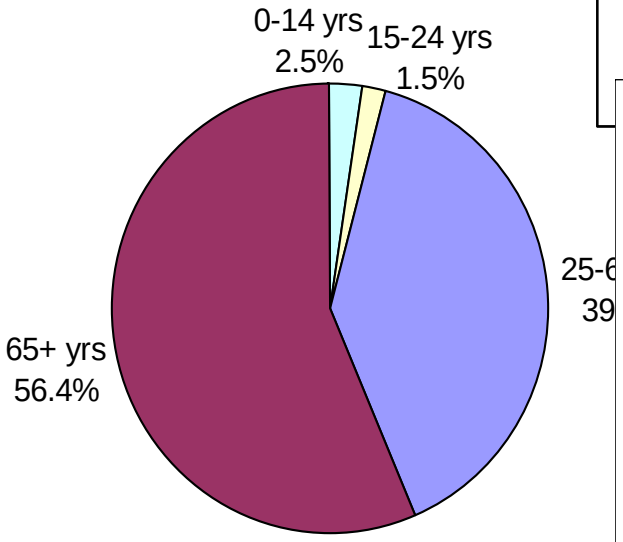
- Present the data in different ways to see additional patterns and relationships
  - Table
    - shows averages, counts, proportions, or rates side-by-side
  - Pie graph
    - Distribution, demonstrates percentages of the whole
  - Bar graph
    - compares quantities
  - Line graph
    - shows trends over time

Presenting Results

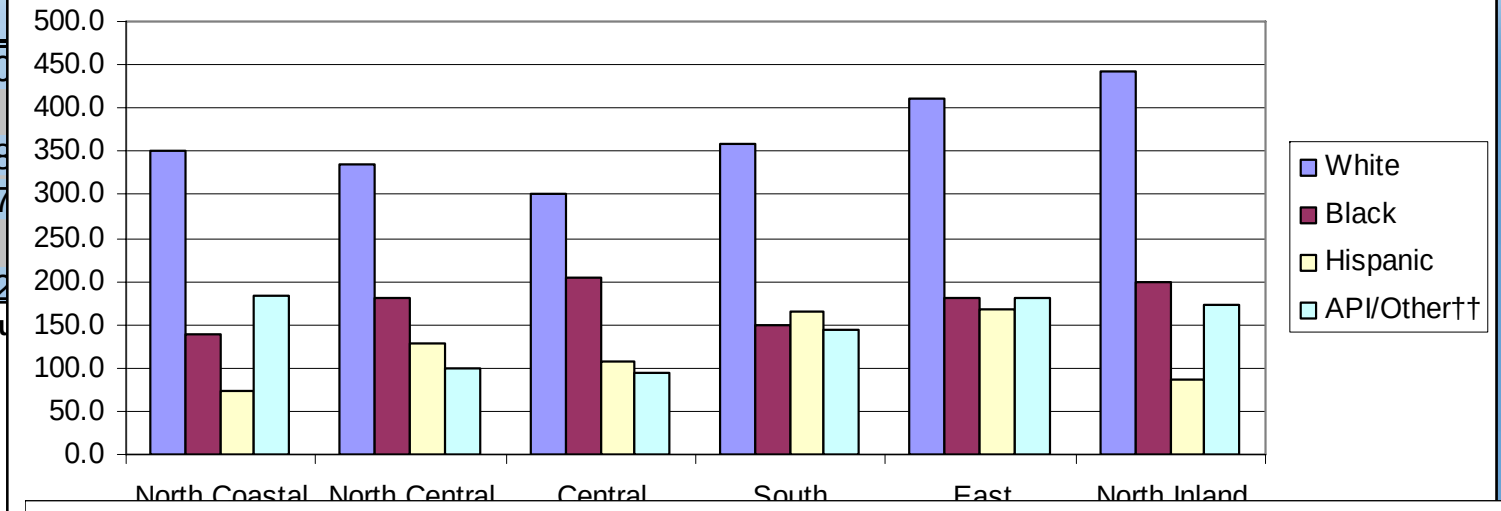
Arthritis† Hospitalizations Among Sa

	North Coastal		North Centra	
	No.	Rate*	No.	Rate*
Total**	1,255	252.3	1,519	256.0
Gender				
Male	536	212.7	635	212.8
Female	719	293.1	884	299.7
Race/Ethnicity				
White	1,051	350.2	1,277	335.2

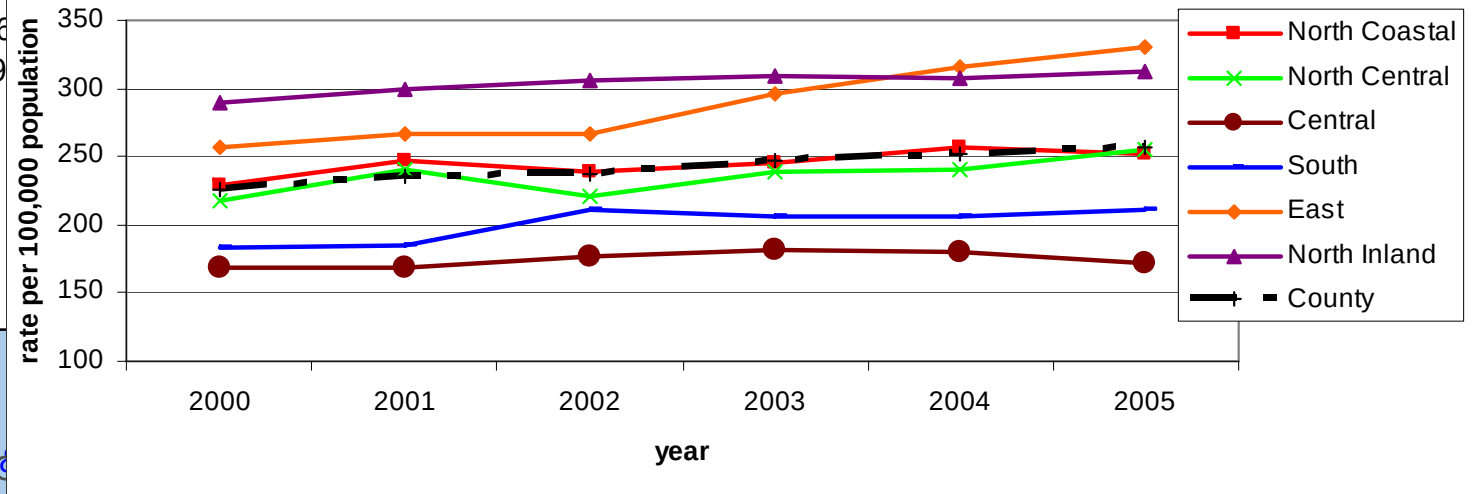
Arthritis Hospitalizations, Age Distribu (N=7785), 2005



Arthritis Hospitalization Rates by Race/Ethnicity, San Diego County, 2005



Arthritis Hospitalizations Among San Diego County Residents, 2000-2005



Source: Hospital Discharge Data, (CA

Definitions

- Continuous Data
  - Information that can be measured on a continuum or scale
  - Data can have almost any numeric value
  - Data can be meaningfully subdivided into categories
  - Examples: Age, weight, height, time

- Categorical Data
  - Information is sorted according to category
  - Defined number of categories
  - Categories do not overlap
  - Examples: Age groups (0-14, 15-24, 25-44, etc.), gender (male, female), marital status (single, married, divorced, widowed)

Grouping Data

- Single year of age 0-105 or age groups?
- Which age groups to use?
  - Child, adolescent, adult, seniors
  - Affected population
    - e.g.: burn-scald injury 0-4 or 0-14 yrs?
    - e.g.: senior falls
  - Target population
    - School based groupings
    - Child bearing women
  - Legal age
    - drive, purchase tobacco, drink alcohol

Presenting Results: Tables

- Bad:

	2001	2002	2003	2004	2005
East	250	225	220	240	235
West	350	300	325	345	300
North	325	300	295	315	310
South	300	250	275	295	250

- Better:

Total Client Seen at County Main Street Clinic, 2001-2005

Division	2001	2002	2003	2004	2005
East	250	225	220	240	235
West	350	300	325	345	300
North	325	300	295	315	310
South	300	250	275	295	250
Total	1225	1075	1115	1195	1095

Source: County, Data Tables Department, 4/30/07.

Presenting Results: Tables

- Title
  - Who, what, where, when
- Footnotes
  - Data source, year
  - Definition of data
  - Explanations of unusual cells/data
    - Small numbers
  - Explanation of missing data
  - Other information pertinent to the understanding of the data
- Tables should be:
  - readable and visually pleasing
  - able to stand alone

Presenting Results: Tables

- What's wrong with this table?

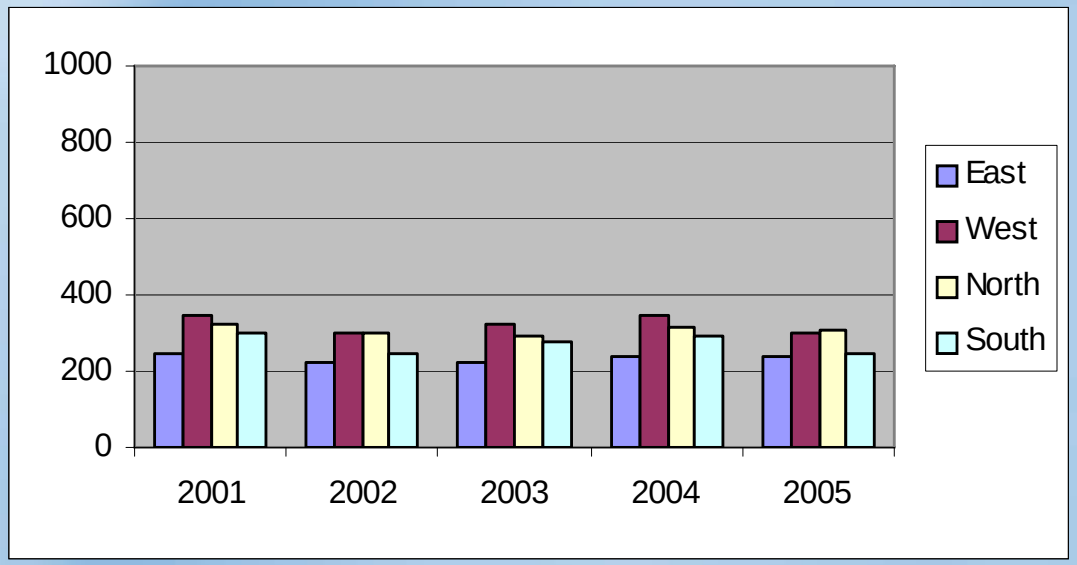
Total Clients seen at County Main Street Clinic, FY 04/05

Division & Subdivision	2001	2002	2003	2004	2005
Sub 1	50	90	66	80	61
Sub 2	5	56	44	8	80
Sub 3	15	79	110	8	9
Sub 4	150	125	100	180	100
Sub 5	20	175	225	165	200
Sub 6	88	0	82	69	60
Sub 7	88	90	81	80	85
Sub 8	88	75	63	86	60
Sub 9	88	75	98	110	95
Sub 10	81	75	74	79	78
Sub 11	114	105	103	110	109
Sub 12	130	120	118	126	124
Total	1250	1125	1135	1215	1155

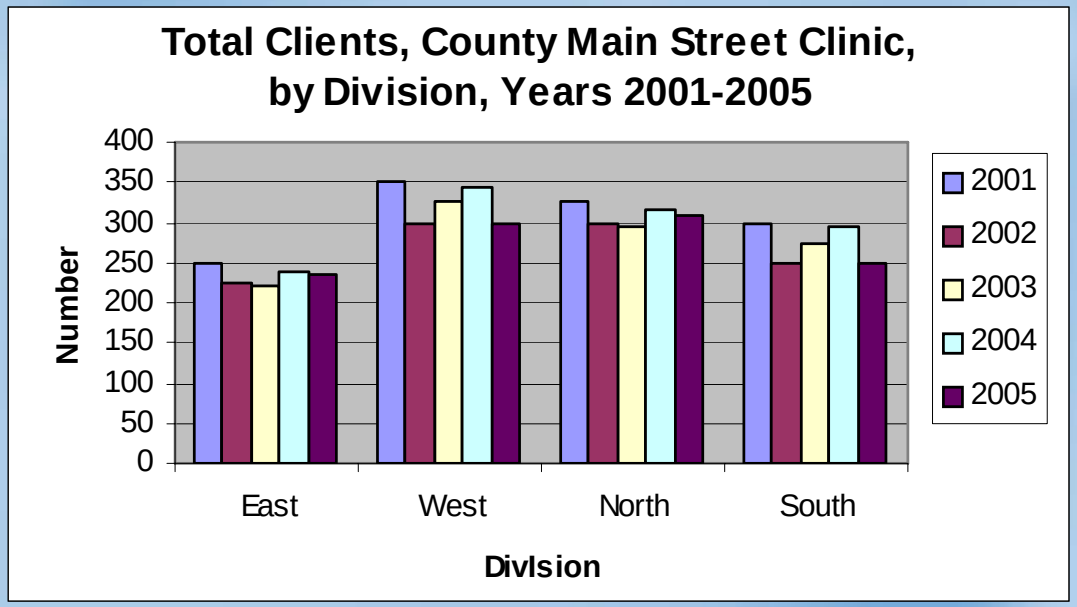
CHECK YOUR DATA!!!!

Presenting Results: Graphs

- Bad:

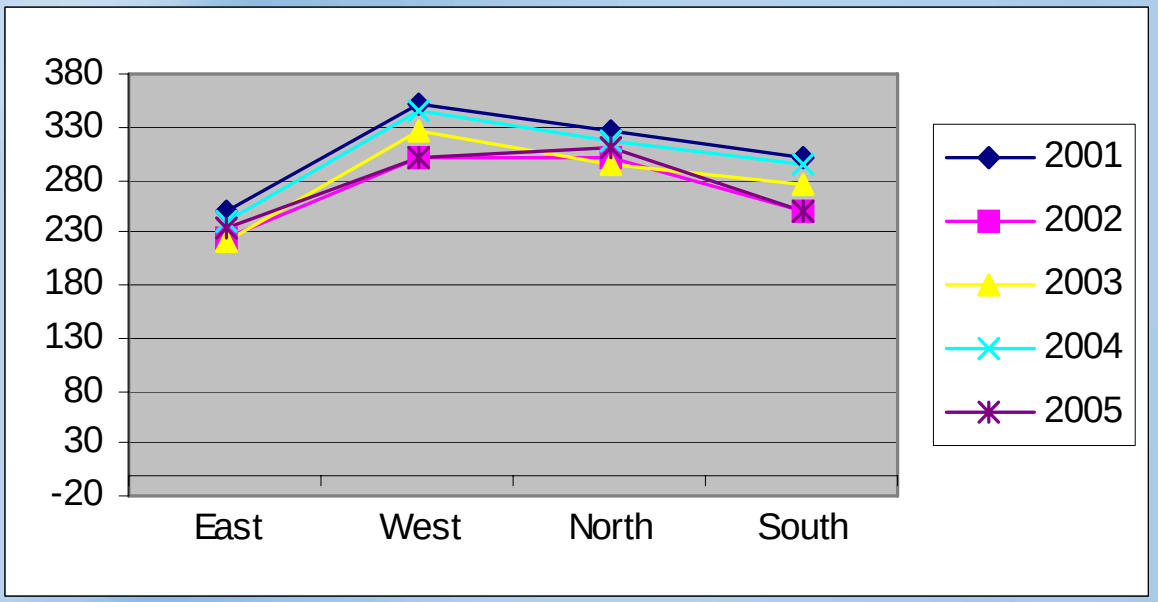


- Better:

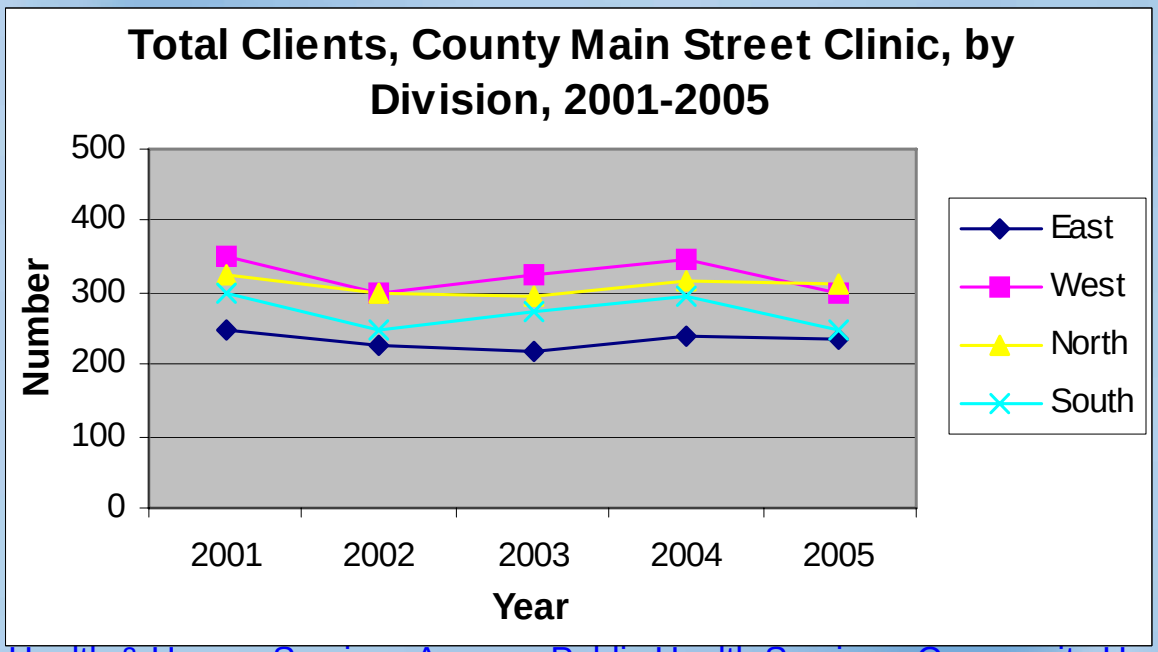


Presenting Results: Graphs

- Bad:



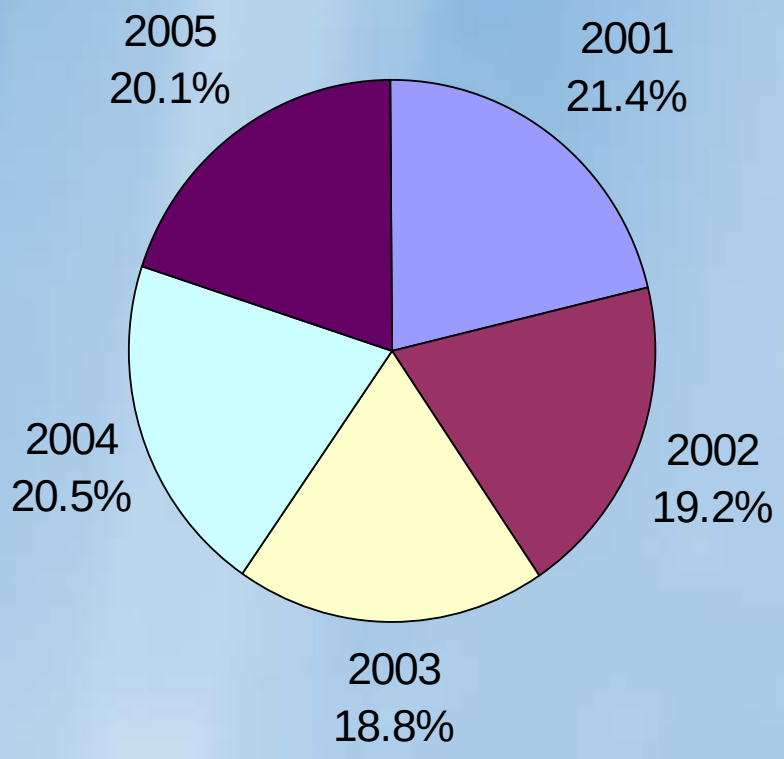
- Better:



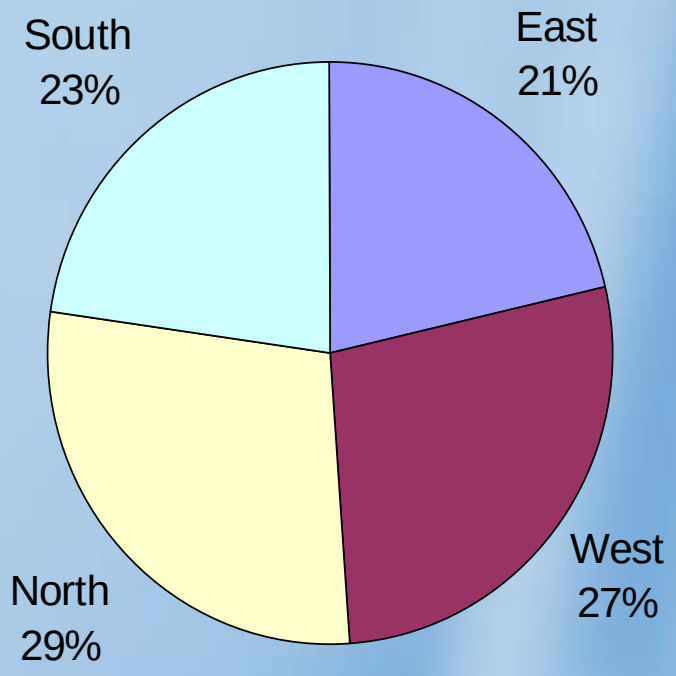
Presenting Results: Graphs

- Which graph is more appropriate?

Total Clients by Year, East Division



Total Clients by Division, 2005



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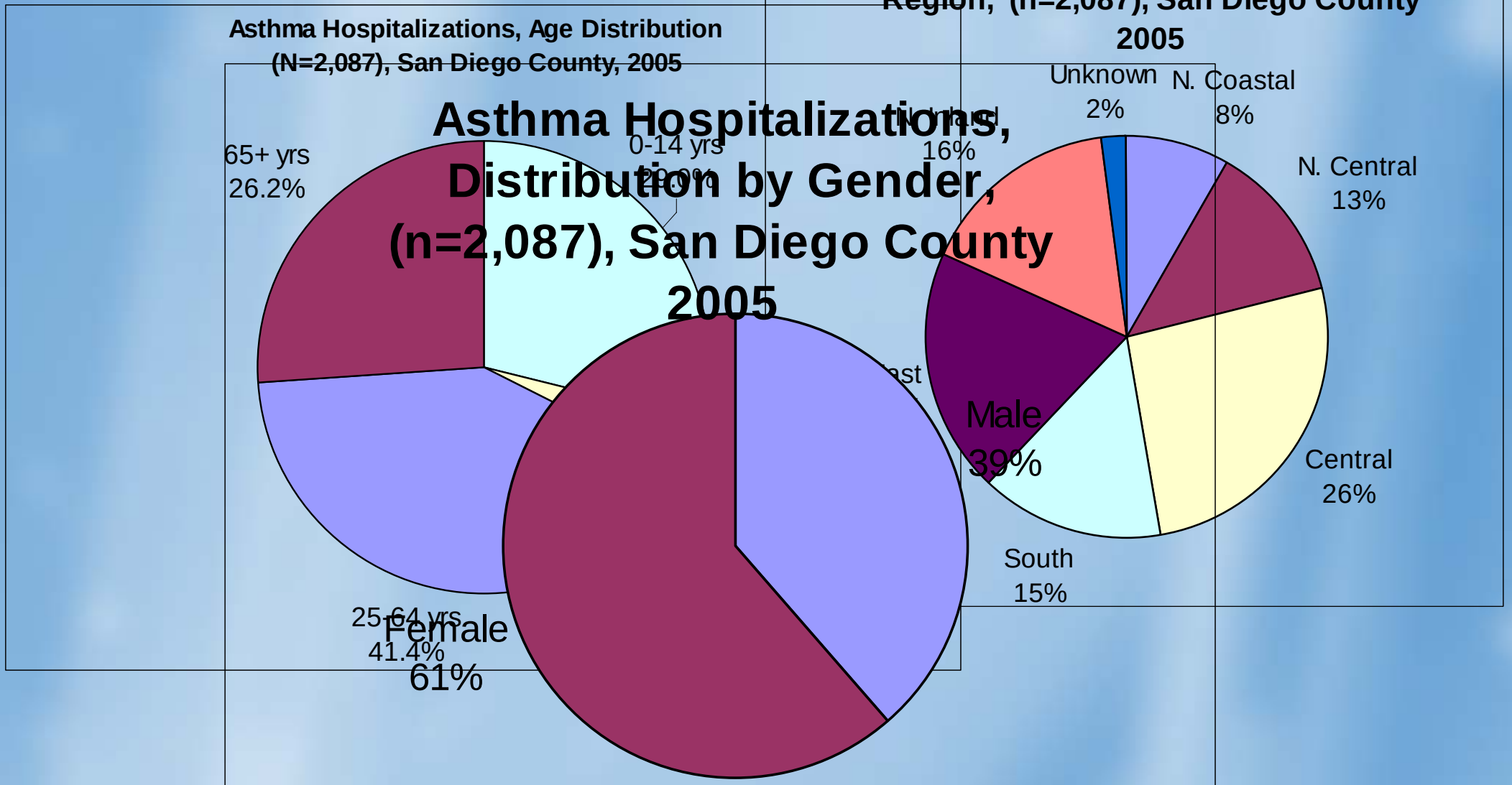
What kind of graph?

Asthma† Hospitalizations Among San Diego County Residents by Location of Residence, 2005 Detail

	North Coastal		North Central		Central		South		East		North Inland		County		County age-adjusted rate*
	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	
Total**	173	34.8	267	45.0	548	110.7	306	67.8	412	90.6	343	62.7	2,087	68.7	70.4
Gender															
Male	54	21.4	109	36.5	229	90.9	127	55.6	132	59.6	139	51.8	809	53.2	52.7
Female	119	48.5	158	53.6	319	131.2	179	80.2	280	120.0	204	73.2	1,278	84.2	92.5
Race/Ethnicity															
White	110	36.6	177	46.5	129	93.0	83	68.3	264	87.6	211	63.9	998	63.5	59.3
Black	9	46.0	15	77.4	187	279.2	23	107.0	43	180.9	17	160.3	301	186.0	204.8
Hispanic	29	21.6	29	40.3	170	85.0	152	64.3	78	87.0	80	56.0	542	61.9	75.0
API/Other†	25	59.8	46	40.4	62	70.8	48	73.0	27	68.7	35	60.7	246	60.6	46.6
Age Group															
0-14	45	41.5	87	85.3	153	140.8	99	96.5	110	114.9	107	89.4	605	95.0	
15-24	10	12.4	<5	§	28	34.8	9	11.1	11	16.6	9	11.2	71	15.2	
25-64	70	27.8	93	27.2	269	101.9	98	44.1	182	75.7	122	43.7	864	54.0	
65+	48	84.8	83	118.0	98	234.2	100	219.4	109	207.7	105	154.8	547	163.4	

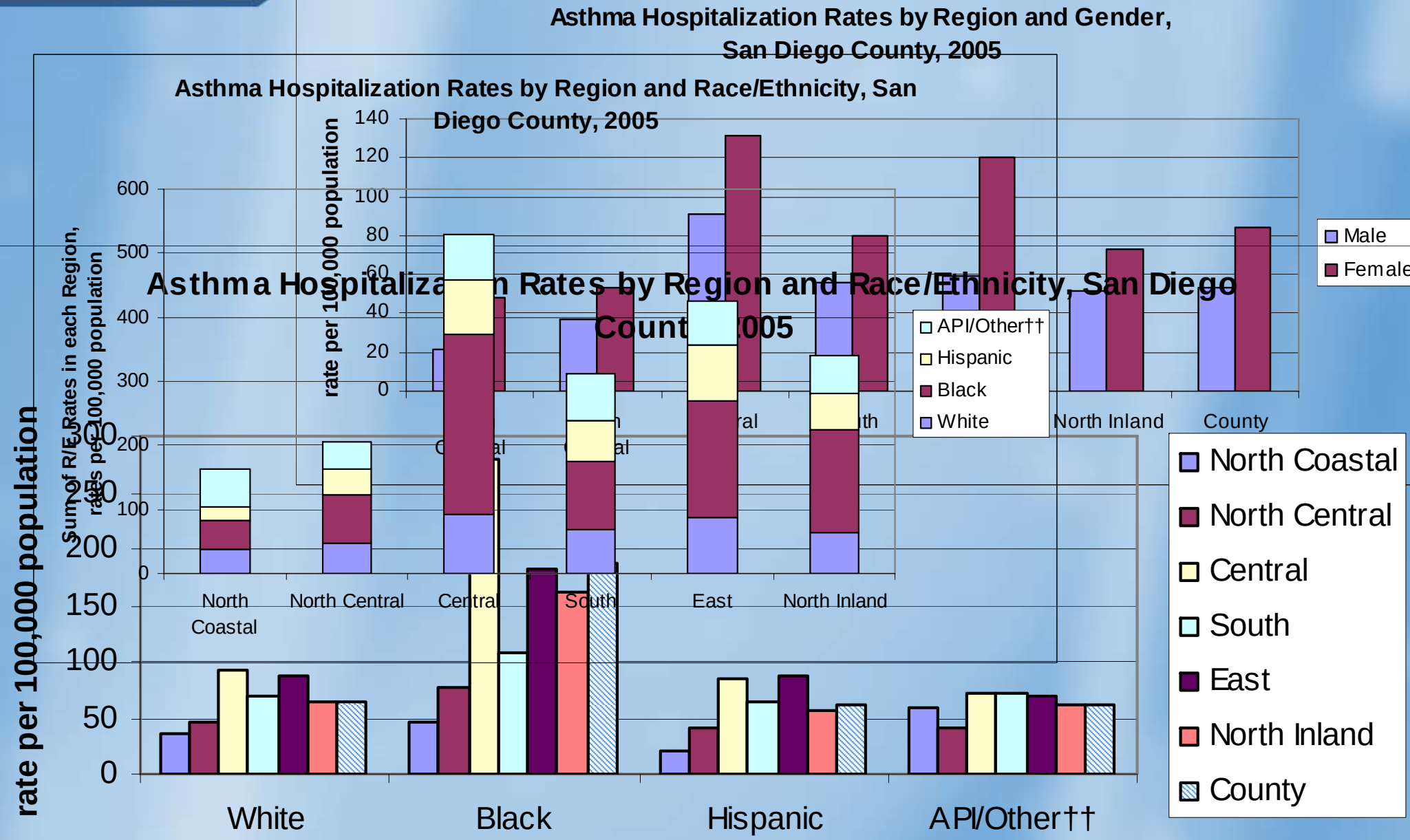
For full footnotes refer to online Community Profiles available at www.SDHealthStatistics.comSource: Hospital Discharge Data, (CA OSHPD), CoSD, HHSA, Community Epidemiology; SANDAG, Current Pop. Est., 9/27/2006.

What kind of graph: Pie



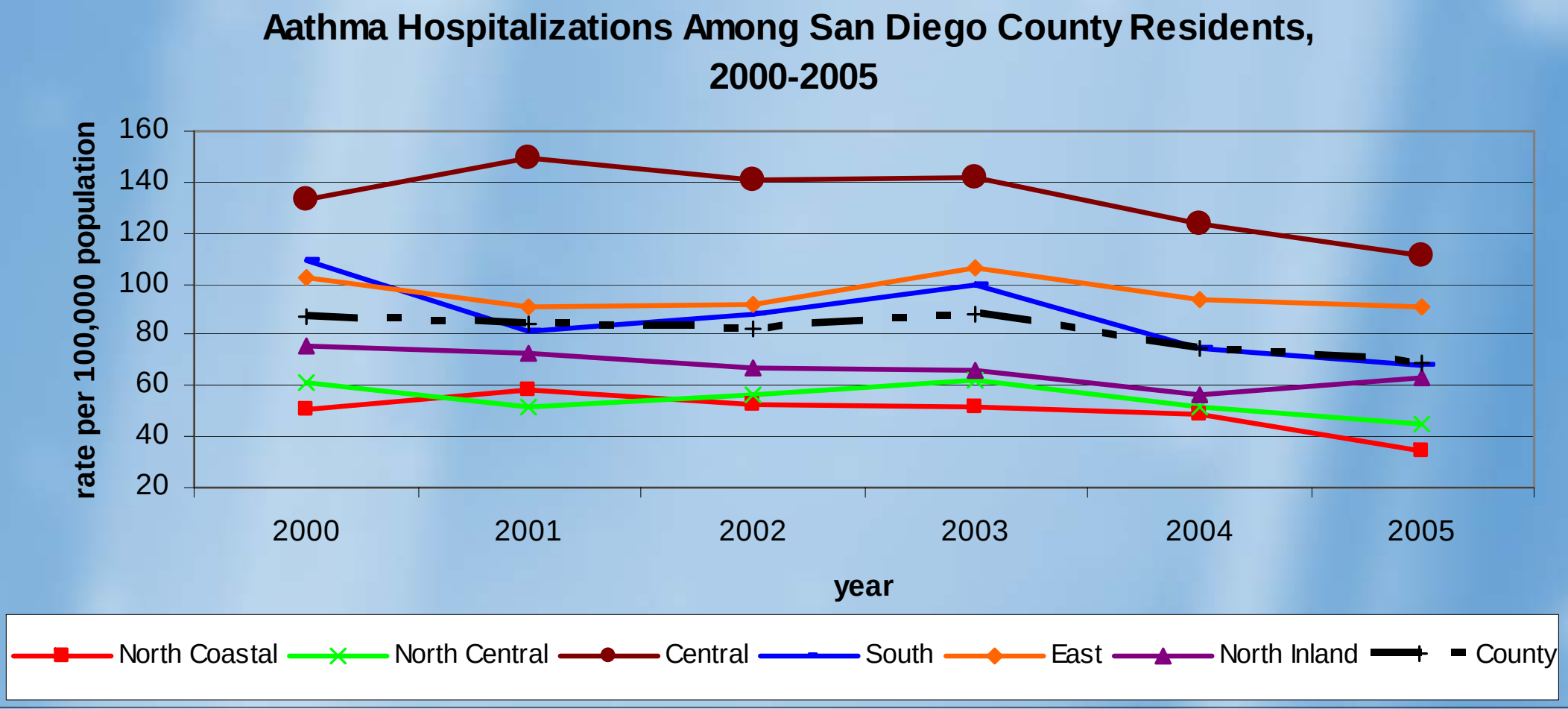
Source: Hospital Discharge Data, (CA OSHPD), CoSD, HHSA, Community Epidemiology.

What kind of graph: Bar



Source: Hospital Discharge Data, (CA OSHPD), CoSD, HHSA, Community Epidemiology.

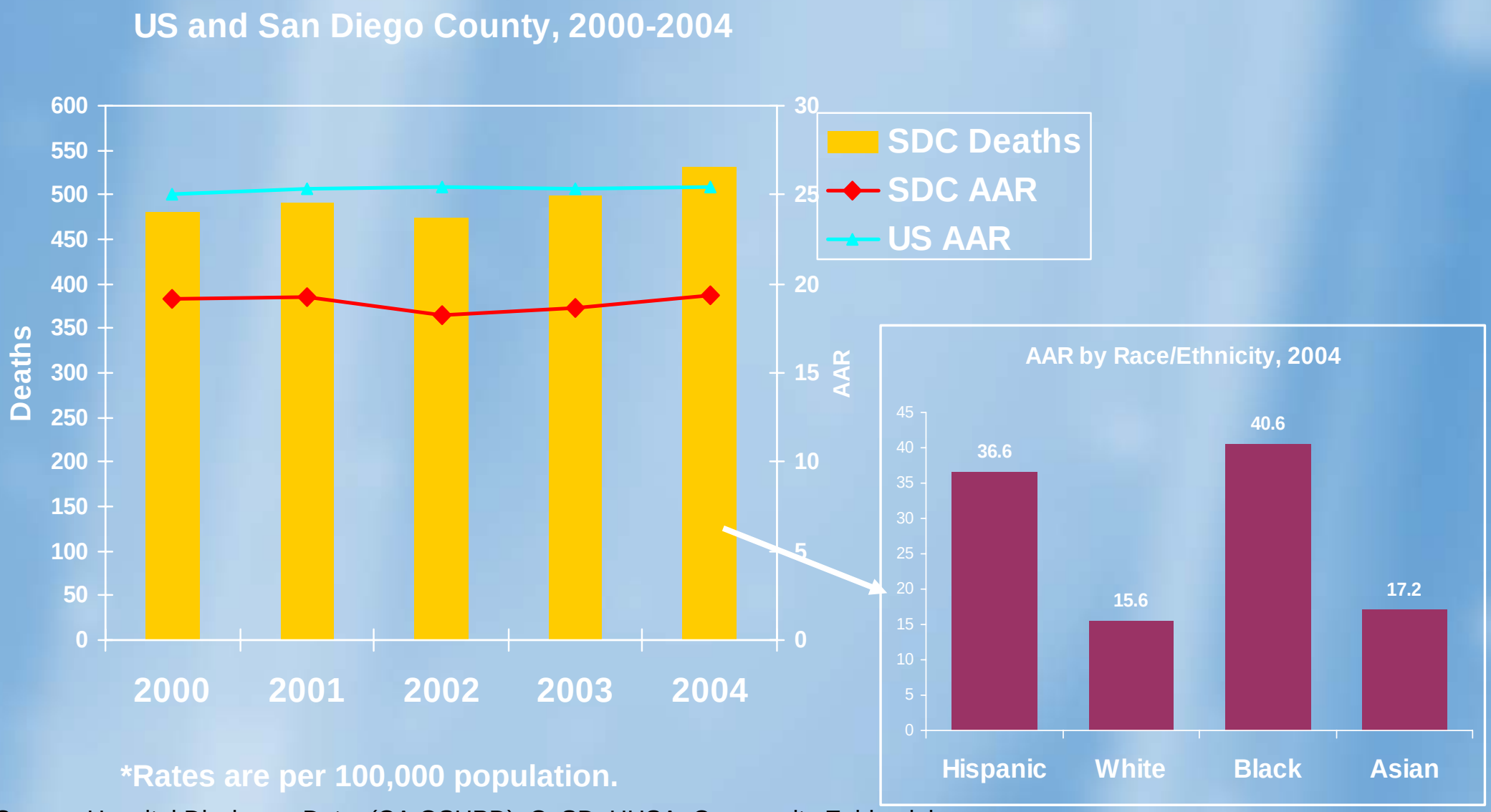
What kind of graph: Line



Source: Hospital Discharge Data, (CA OSHPD), CoSD, HHSA, Community Epidemiology.

Complex Graphs

Diabetes Deaths, 2000-2004: Counts and Age-Adjusted Rates* (AAR)



*Rates are per 100,000 population.

Source: Hospital Discharge Data, (CA OSHPD), CoSD, HHSA, Community Epidemiology.

Presenting Results: Graphs

- Title
- Footnotes
- Graphs should be:
  - Readable and visually pleasing
  - Able to stand alone
  - Appropriate
    - Bar Graph
    - Line Graph
    - Pie Chart

Presenting Results: Narrative

- Narrative statements are written or verbal descriptions of the results of the data.
  - Highlight main points from the data
    - Overall totals, highs and lows
    - Row high, column high
  - Who, What, Where, When
  - May also include explanations or interpretations

Presenting Results: Narrative

- “The annual rate of ED discharge was highest among the very young and the very old. Based on data for this quarter, approximately one out of every four children aged 0 to 4 years in San Diego County will have been treated and discharged from a San Diego County ED over the course of a year.”

- “The annual rate of ED discharge for 0 to 4 year olds in San Diego County decreased from 31,731 per 100,000 during the first quarter of 2006 to 25,691 per 100,000 during the second quarter. This decrease is due in part to seasonal variations in ED visits for infectious illnesses, such as acute respiratory infections.”

Presenting Results: Bullets

Fireworks Related Injuries

- In 2005, 10800 people were treated in U.S. emergency departments for fireworks-related injuries and 4 people died.
- Children 14 years and younger sustained about 45% of injuries related to fireworks, and boys represented the majority of all those injured. Typically, two thirds of injuries from fireworks in the United States occur in the days surrounding the July 4th holiday.
- Injuries from fireworks around July 4th 2005, most often affected the hands and fingers (31%), eyes (25%), and head and face (20%).
- In San Diego County, paramedics typically do not see a significant number of fireworks related injuries on July 4th. In 2004 there were three injuries. In 2006 however, there were no paramedic responses for firework related injuries on July 4th.

Source: Fourth of July Holiday Safety Fact Sheet, 2007. Prepared by CoSD, HHSA, Emergency Medical Services.

Definitions

- Relative Ratios
  - Compares the rate of one event occurring to the rate of another
  - Includes magnitude (size) and direction (more/less)
  - Found by dividing one rate by another
  - Example
    - The rate of suicide among elderly men is five times greater than among elderly women.

DIRECTION

MAGNITUDE

Putting Your Data into Perspective

- Organize your data into digestible chunks
- Use visual representations as well as text to display key findings
- Interpret data to identify prevention or intervention opportunities

Presenting Results

- Determine what interpretations can be drawn from each finding
- Are the results similar to what you expected? If not, discuss why you think they are different
- Brainstorm alternative explanations for your results to make sure you have considered all possibilities
- Make sure the conclusions answer the original assessment questions
- Draw conclusions and recommendations that can be shared with external audiences

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Special Considerations

Limitations

- Who's missing from data
  - Only those included in database, not everyone
  - Examples:
    - ED Data includes only those patients who were treated and discharged from the emergency department, not all patients who visited the ED.
    - Trauma registry includes only those patients for whom injuries were severe enough to require admittance to a trauma center, not all patients who suffered a traumatic injury.

- What's missing from data
  - Example:
    - ED Data does not include information on length of time in the ED.

Limitations

- Changes in categories/classifications
  - These can occur over time
  - Example:
    - ICD9 to ICD10, collection of more than one race/ethnicity, etc.
  - May occur in the numerator but not denominator (or vice-versa)

- Changes in standards
  - Change in age adjustment from 1940 standard million to 2000.

Limitations

- Bias
  - Any trend in the collection, analysis, interpretation, publication, or review of data that can lead to conclusions that are systematically different from the truth.
  - Examples:
    - Sponsor of study
      - Pharmaceutical sponsored study
    - Who records/codes the data
      - HIV test counselors do not ask the patient gender
      - In death data, race/ethnicity may be determined by the mortuary
    - How data is collected
      - Billing data vs. medical records
    - Accidental recording errors

Small Numbers

- Do not calculate rates on < 5 events
  - Produces unstable rates

- Do not calculate percent change on < 20 events

Consult epidemiologist for appropriate solution!!

The Essential Footnote

- Always document the source of your data. Include:
  - the source of the data
  - the time frame it represents
  - the name of the database
  - who modified data or calculated statistics and when

- Many databases offer suggested citation, use them

The Essential Footnote

- The purpose of a footnote is to identify the source and other relevant information for the reader of your document
- The most important purpose of a footnote is to ensure that you will be able to figure out how you got the data next year when you have to reproduce it

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The Essential Footnote

Healthy People 2010 Target: 162 heart disease deaths per 100,000 population, age-adjusted*

USA: 172 deaths per 100,000 population, age-adjusted (2003)* ‡

California: 178 deaths per 100,000 population, age-adjusted (2003)* ‡

Coronary Heart Disease† Deaths Among San Diego County Residents by Location of Residence

	North Coastal		North Central		Central		South		East		North Inland		Unknown§		County		County age-
Year	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	adjusted rate*
2000	658	143.1	863	155.3	703	146.4	669	173.6	836	189.2	801	163.2	22	---	4,552	161.8	185.1
2001	693	148.3	780	138.6	651	133.2	648	163.1	881	196.8	831	166.3	28	---	4,512	157.6	178.4
2002	673	139.3	694	120.4	676	138.9	631	153.1	850	188.4	700	137.0	23	---	4,247	145.4	162.9
2003	671	137.3	681	115.1	600	122.9	598	140.4	832	183.8	745	141.9	53	---	4,180	140.7	155.1
2004	630	126.9	696	117.4	605	122.7	589	135.2	725	159.1	723	134.1	51	---	4,019	133.4	144.4
2005																	

* Rates per 100,000 population. County and other age-adjusted rates per 100,000 2000 US standard population.

† Coronary Heart Disease death refers to (underlying cause of death) ICD-10 codes I11, I20-I25.

‡ Source: national Vital Statistics System, CDC, NCHD, Online database accessed 12/20/06: http://wonder.cdc.gov/data2010/source.htm.

§ Rates not calculated for fewer than 5 events. Rates not calculated in cases where zip code is unknown.

Source: Death Statistical Master Files (CA DPH), County of San Diego, Health & Human Services Agency, Community Epidemiology; SANDAG, Current Population Estimates, 9/27/06.

Prepared by County of San Diego (CoSD), Health and Human Services Agency (HHSA), Community Health Statistics, 12/12/2006.

Ethics & Policies

- Ethical research & reporting
  - Be clear & accurate, double check
  - Be fair, reduce bias
  - Protect confidentiality
- Policies – many organizations have policies or guidelines for handling data, refer to them when available or develop them if there is none

Break

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Health Indicators

Health Indicators

- A health indicator defines a measure of health or a factor associated with health among a specified population.
  - Measures that guide progress toward a goal
  - Includes
    - Population (Who)
    - Disease/injury and level (What)
      - i.e. not just heart disease, but heart disease deaths or hospitalization or prevalence
    - Geographical location (Where)
    - Time period (When)
    - Amount of disease or injury (rate, frequency, percent)
  - Used in:
    - Needs assessments
    - Program evaluation
    - Routine surveillance

Indicators of Health Status

Environmental Determinants

Indicators include: population with access to services such as potable water, sewerage and excreta disposal[i], levels of mercury in water, % of acceptable water analysis[v]...

Social Determinants

Demographic Indicators

Population by age and sex[ii], crude birth rate[i], fertility rate[i],urban population[i], life expectancy at birth[i]...

Socioeconomic Indicators

Literate population (15+ years old) [i], annual GDP growth rate[i], calories availability[i], highest 20% / lowest 20% income ratio[i]...

Behavioral Determinants

Indicators include: Proportion of regular smokers[ii], contraceptive use[i]...

Health System-related Determinants

Indicators include: Human resources per 10,000 pop.[i], immunization coverage in infants under 1 year old (%)[i], % births attended by trained personnel[ii]...

Health Status Indicators

Perceived Health

- Satisfaction: Proportion of the population 15 and over that report being dissatisfied with their social life[ii]...
- Quality of life: Proportion of the population that report perceiving themselves in fair or poor health[ii]...

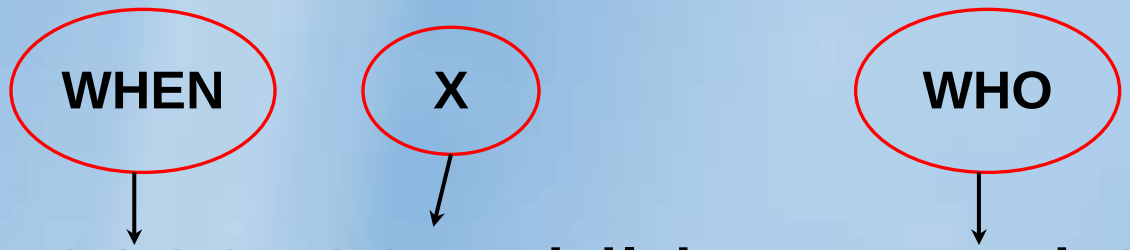
Objective health

- Mortality
  Maternal mortality[i,vi], infant mortality[i,vi], registered deaths from homicide[i], mortality rates from communicable diseases[i]...
- Morbidity
  Measles incidence[i], confirmed dengue cases[ii], AIDS annual incidence rate[i], cancer incidence rate[ii]...
- Disability
  Prevalence of different types of disability in a given population[iii], average number of days per year lost to school, work, homemaking and other social roles for a defined population[iv]...

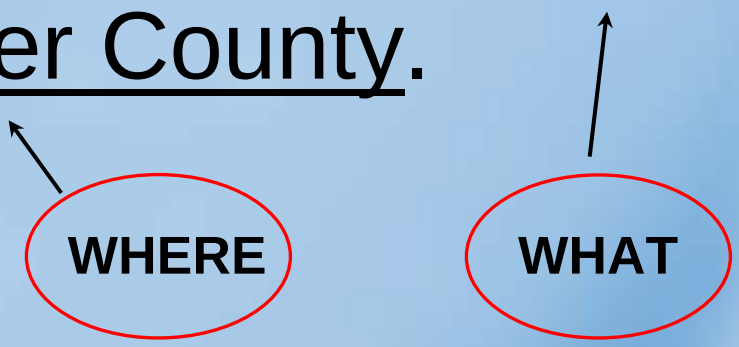
Source:http://www.paho.org/english/dd/ais/eb_v22n4.pdf

Indicator Statements

- In (When), X number of (Who) were (What) in (Where).

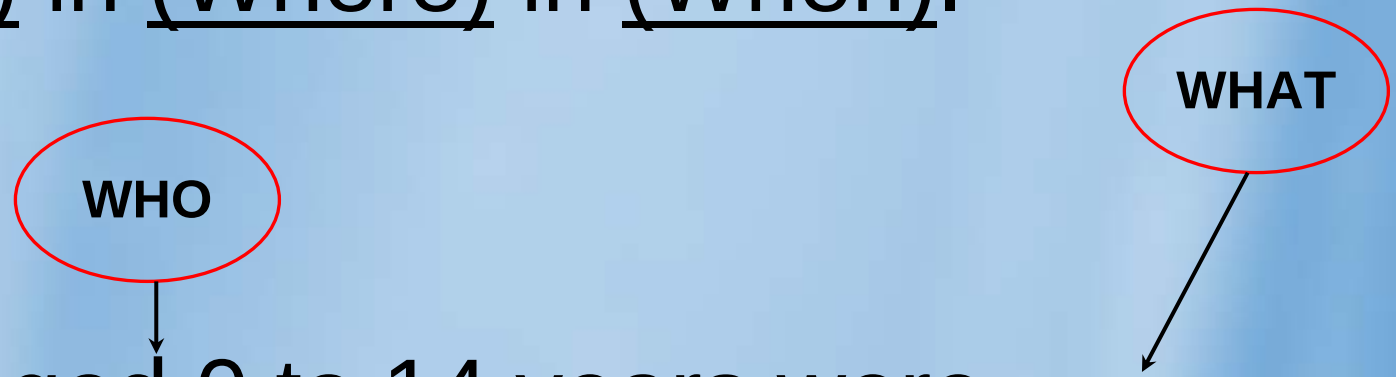


- In 2003, 397 children aged 0 to 14 years were hospitalized due to a playground injury in Summer County.



Indicator Statements

- (Who) were (What) at a rate of X per (Constant) in (Where) in (When).



- Children aged 0 to 14 years were hospitalized due to a playground injury at a rate of 122 per 100,000 in Summer County in 2005.

Health Indicator Examples

Healthy People 2010 Target: 166 heart disease deaths per 100,000 population, age-adjusted*

USA: 172 deaths per 100,000 population, age-adjusted (2003)* ‡

California: 178 deaths per 100,000 population, age-adjusted (2003)* ‡

Coronary Heart Disease† Deaths Among San Diego County Residents by Location of Residen

	North Coastal		North Central		Central		South		East		
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2000	658	143.1	863	155.3	703	146.4	669	173.6	836	169.2	80
2001	693	148.3	780	138.6	651	133.2	648	163.1	861	196.8	83

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Nonfatal Hospitalizations for Unintentional Injury, Ages 0-14 Years San Diego County, 2000-2004

	Age Groups				TOTAL
	<1	**1 - 4**	**5 - 9**	**10 - 14**	**0 - 14**
Falls	205	1,038	1,296	1,012	3,551
Bicycle Related Injury	0	44	245	340	629
Struck by Object	16	111	164	369	660
Motor Vehicle Occupant	14	92	167	200	473
Pedestrian Related Injury	5	118	143	143	409
Burn - Scald	61	254	65	36	416
Poisoning	23	273	42	62	400
MV/Transport Related, Other	1	23	122	289	435
Natural/Environment	25	145	98	87	355
Cut/Pierce	2	44	53	47	146
Drowning/Submersion	4	84	24	14	126
Suffocation/Airway Obstruction	38	48	10	10	106
Firearms	0	2	3	9	14
Other	87	218	137	246	688
TOTAL	481	2,494	2,569	2,864	8,408

http://www.dhs.ca.gov/epic/

Nonfatal Hospitalization for Unintentional Injury, San Diego County, 2000-2004, Ages 0-14 Years, Morbidity Rates per 100,000

	Age Groups			TOTAL
	0 - 4	5 - 9	10 - 14	0 - 14
Falls	121.1	125.2	95.1	113.6
Bicycle Related Injury	4.3	23.7	32.0	20.1
Struck by Object	12.4	15.8	34.7	21.1
Motor Vehicle Occupant	10.3	16.1	18.8	15.1
Pedestrian Related Injury	12.0	13.8	13.4	13.1
Burn - Scald	30.7	6.3	3.4	13.3
Poisoning	28.8	4.1	5.8	12.8
MV/Transport Related, Other	2.3	11.8	27.2	13.9
Natural/Environment	16.6	9.5	8.2	11.4
Cut/Pierce	4.5	5.1	4.4	4.7
Drowning/Submersion	8.6	2.3	1.3	4.0
Suffocation/Airway Obstruction	8.4	1.0	0.9	3.4
Firearms	*	*	0.8	0.4
Other	29.7	13.2	23.1	22.0
TOTAL	289.9	248.1	269.2	269.0

*Rates not calculated on fewer than 5 deaths.

http://www.dhs.ca.gov/epic/

SANDAG population estimates.

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SMART Objectives

Definitions

- Indicator = Point in Time
  - Measure
  - Outcome measure
- Objective = Indicator + Change
  - Program measures
  - Performance measures
  - Program outcomes
- Terminology may vary!!

SMART Objectives

- **S**pecific and specify what you want to achieve.
- **M**easurable and indicate what is to be measured.
- **A**chievable and attainable considering available resources.
- **R**elevant and focused on desired outcomes and results rather than methods.
- **T**ime-framed to identify when or within what period the objective is to be achieved.

SMART Objectives

- Six elements of a SMART objective statement include:
  - Quantified target (Who?)
  - Measurable indicator (What *is to be done?*)
  - Geographic location of persons receiving the intervention (Where?)
  - Baseline data from previous study or intervention results (a Rate or Frequency)
  - Result (To a percent or number)
  - Time frame (When *will the objective be reached?)*

SMART Objectives

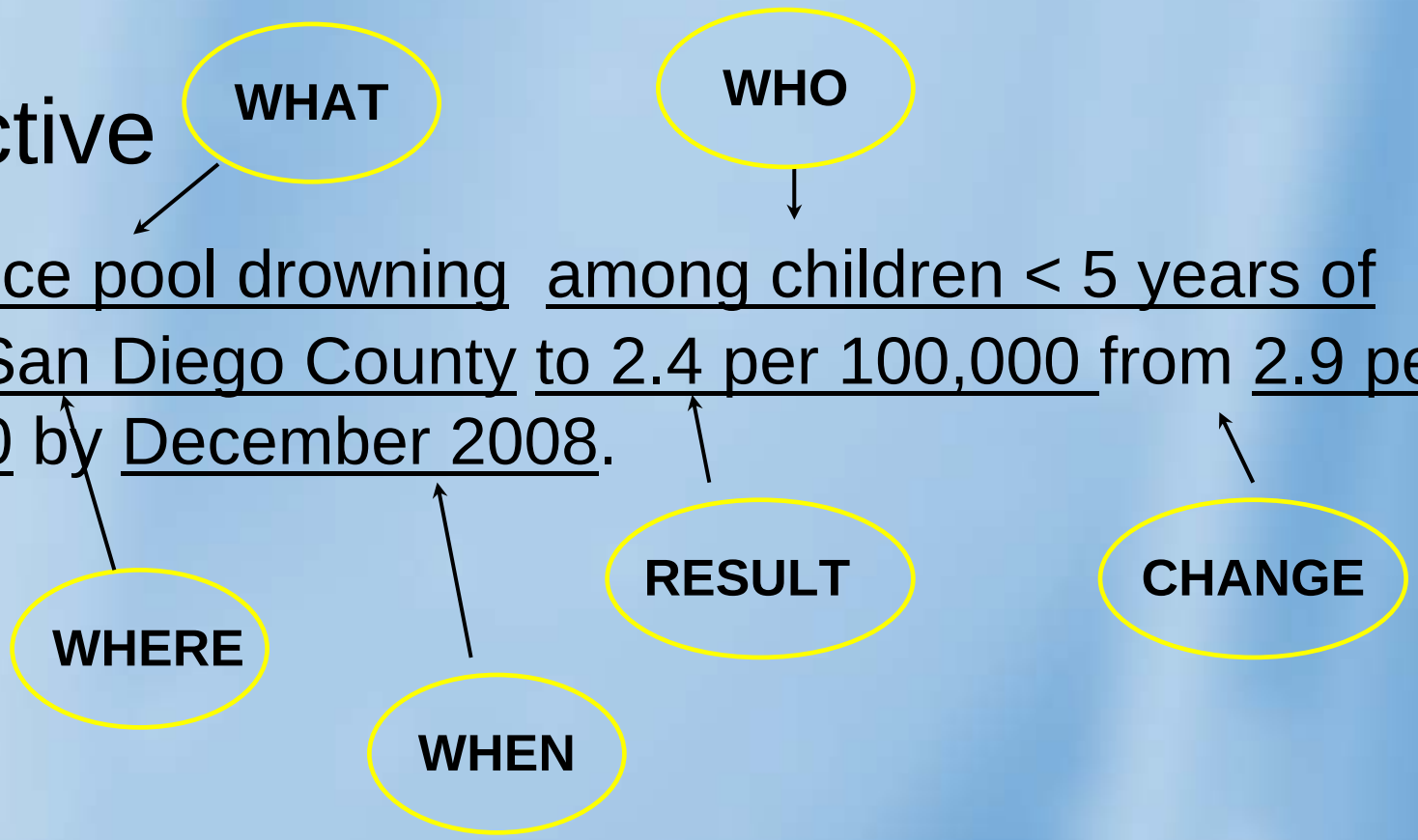
- The elements can be listed in any order
- It is important to write an objective that specifies outcomes
  - Who is the target population?
  - Where are they located?
  - What are you proposing to do?
  - When will the objective be accomplished?

SMART Objectives

- Goal

  To prevent childhood injuries in San Diego County.

- Objective

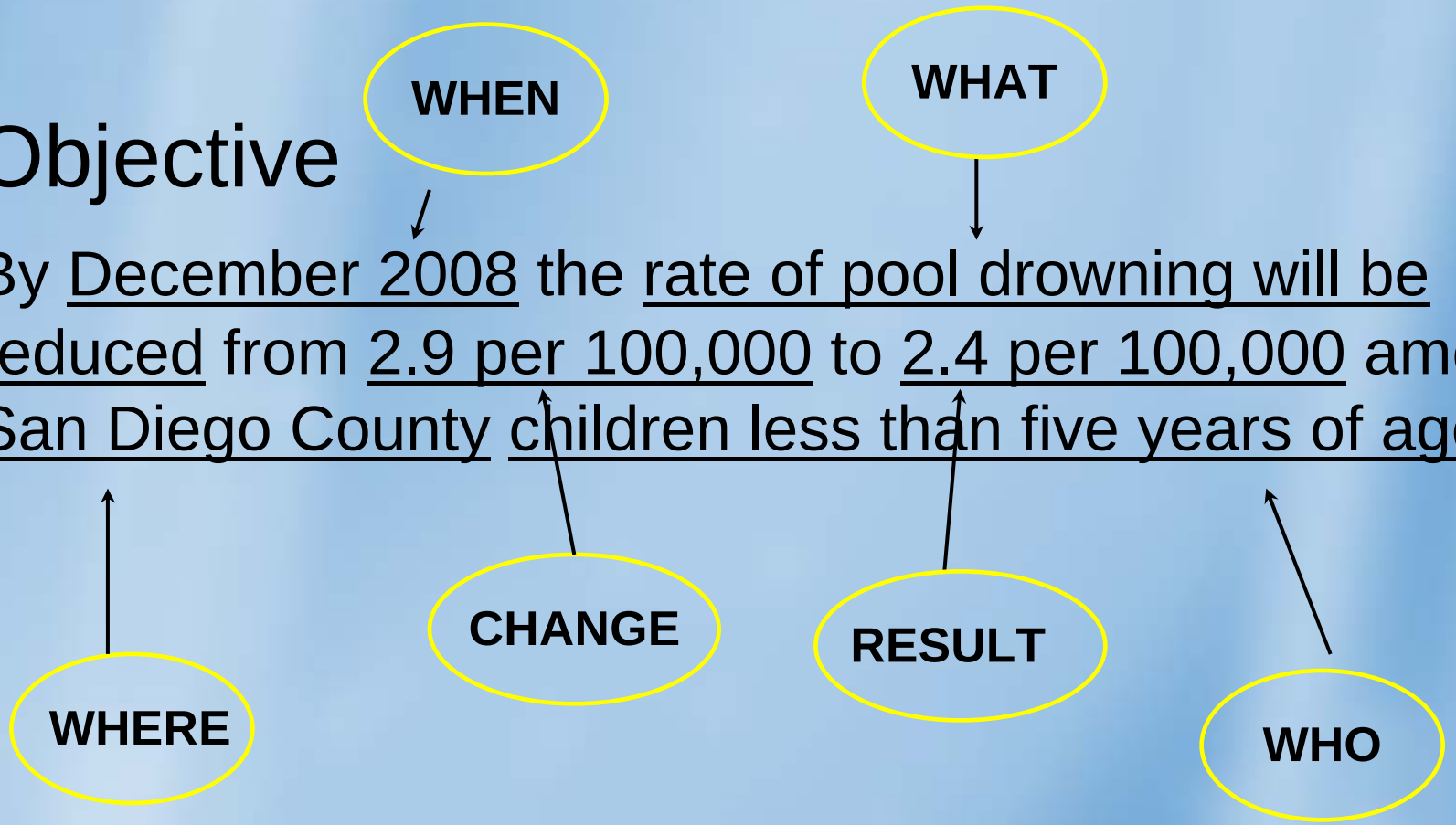


SMART Objectives

- Goal

  To prevent childhood injuries in San Diego County.

- Objective



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Nonfatal Hospitalization for Unintentional Injury, San Diego County, 2000 - 2004, Ages 0 - 14 Years Morbidity Rates per 100,000

	Age Groups			TOTAL
	0 - 4	**5 - 9**	**10 - 14**	**0 - 14**
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http://www.dhs.ca.gov/epic/

SANDAG population estimates.

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A Data Analysis Example:

Shopping Cart and Stroller Injuries in Children

Background

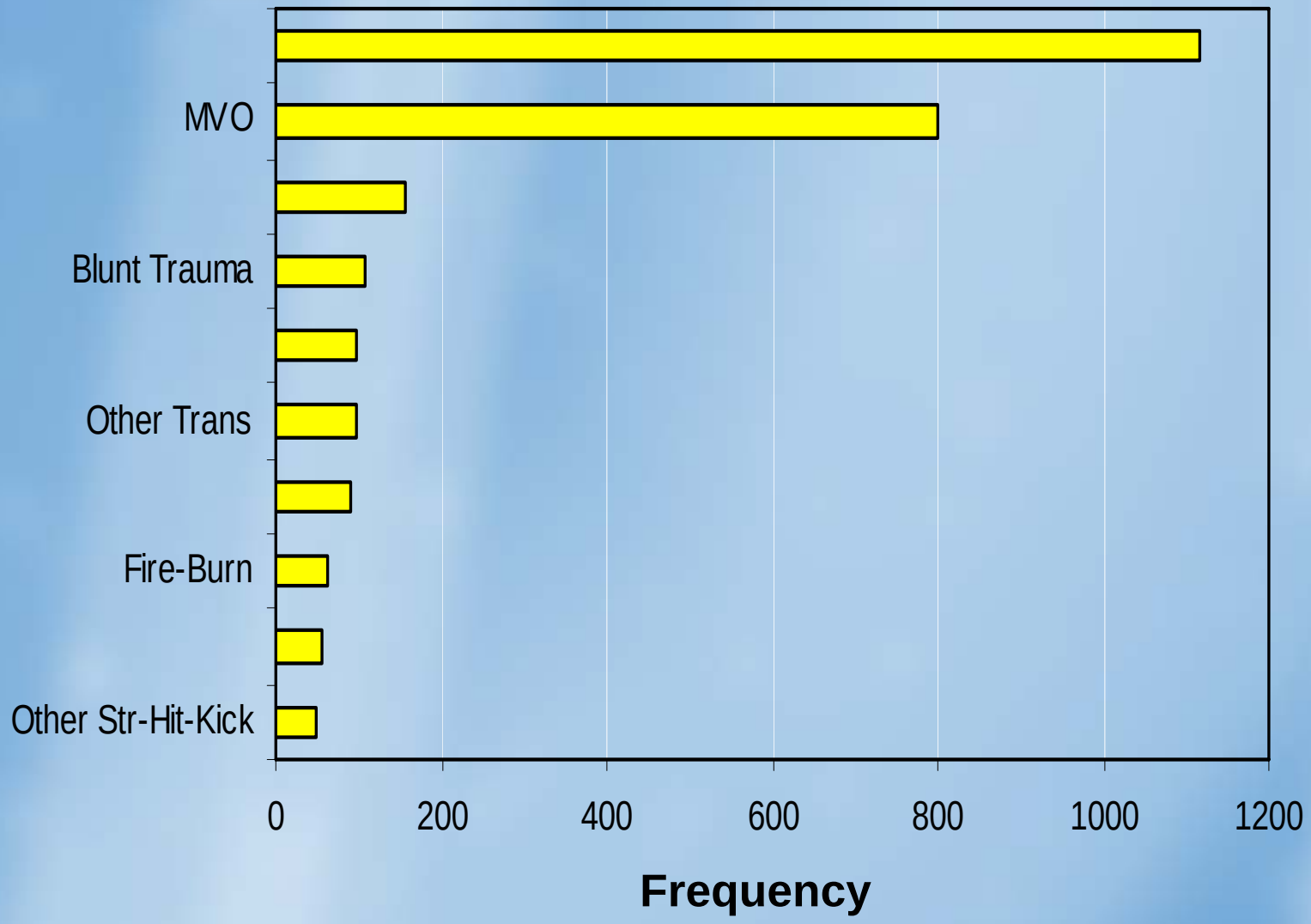
- Nationally, head injuries account for approximately two-thirds of all injuries associated with falls from shopping carts.
  - Of these, approximately 54% suffer severe injuries such as concussions and fractures.
- Mild head injuries can have significant and sustained impacts on behavior and the ability to learn.

Background

- Each year almost 24,000 children ages 14 and under are treated in hospital emergency rooms for injuries associated with shopping and grocery carts.
  - 84% of these injuries occurred to children under age 5.
  - This type of injury has increased by 30% since 1985 among children under age 5.
- Less known and documented are stroller related injuries.

Prehospital Statistics-Causes of Injury

0-9 Year Old Prehospital Patients (FY 00/01)



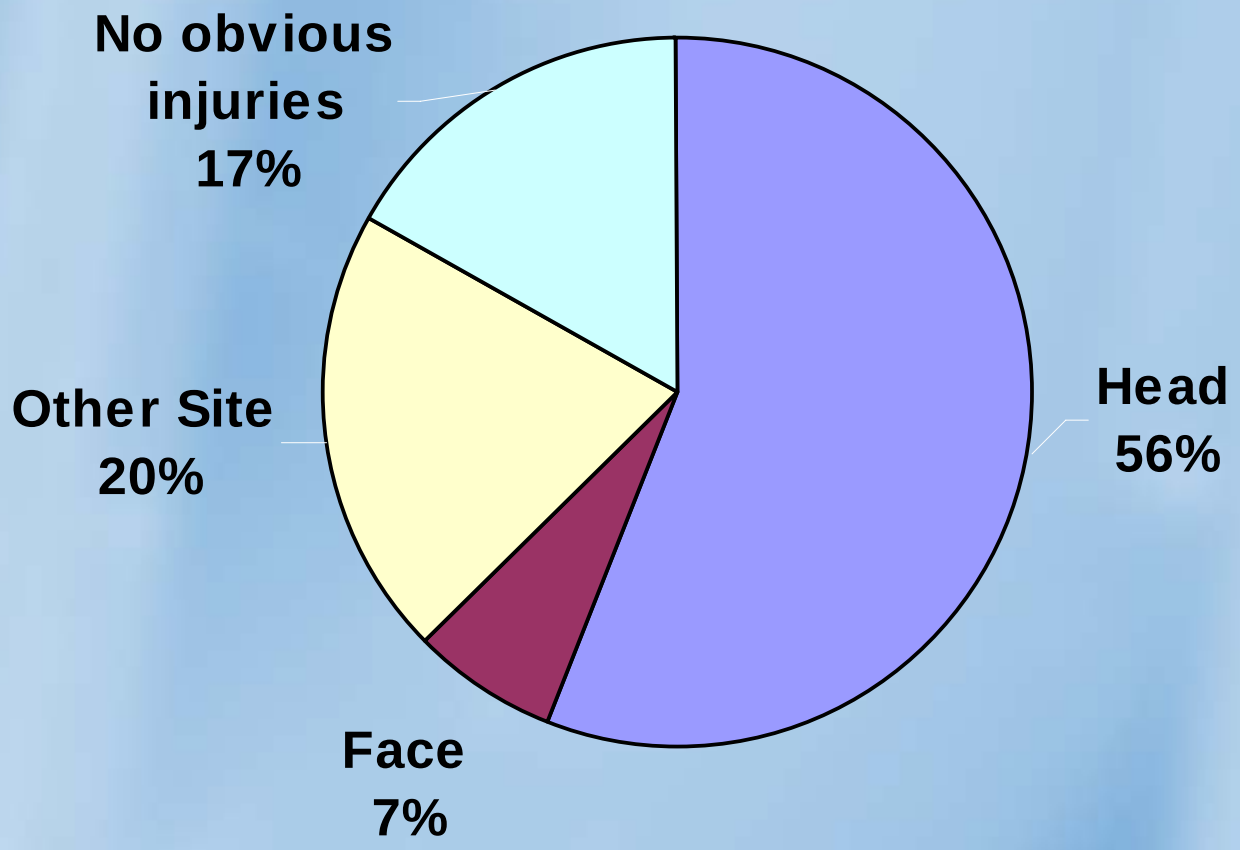
During FY 00/01 in San Diego County, falls were the leading cause of injury requiring paramedic attention in children under the age of 10.

In San Diego County

- In the San Diego County prehospital setting, an annual average of 41% of children (0-14 years old) who are transported by paramedics/EMTs have a traumatic chief complaint.
- The majority of these injuries were due to falls (29%) and motor vehicle crashes/passengers (22%).
- A more detailed look revealed that injuries involving shopping/grocery carts and strollers were quite common. This high proportion of shopping/grocery cart and stroller related injuries prompted further investigation.

Location of Shopping Cart and Stroller Injuries

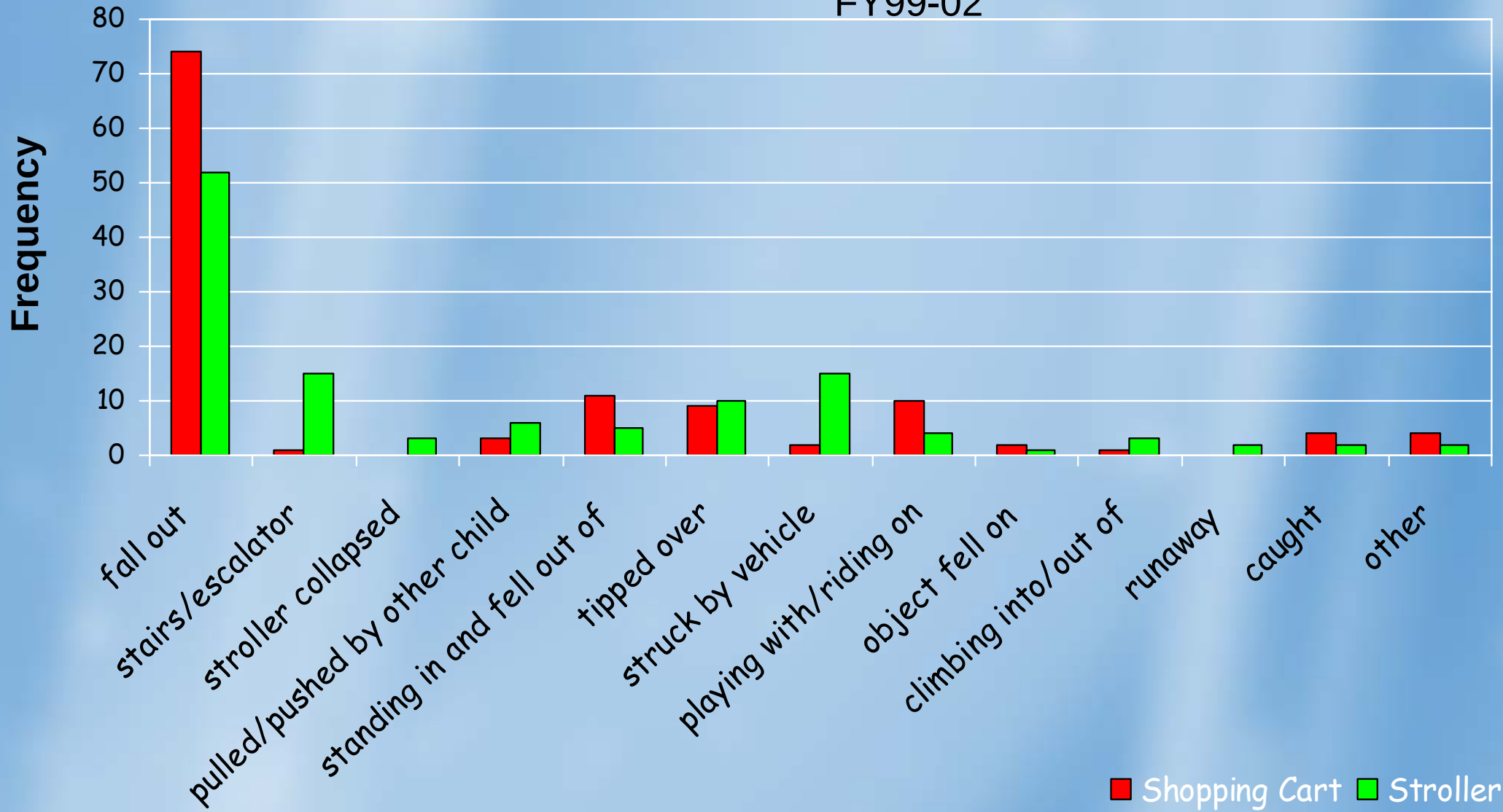
San Diego County Selected Injuries by Location, Ages 0-14, FY99-02



Source: County of San Diego, Health and Human Services Agency, Division of Emergency Medical Services, MICN Database, 1/99-8/02.

Circumstances of Shopping Cart and Stroller Injuries

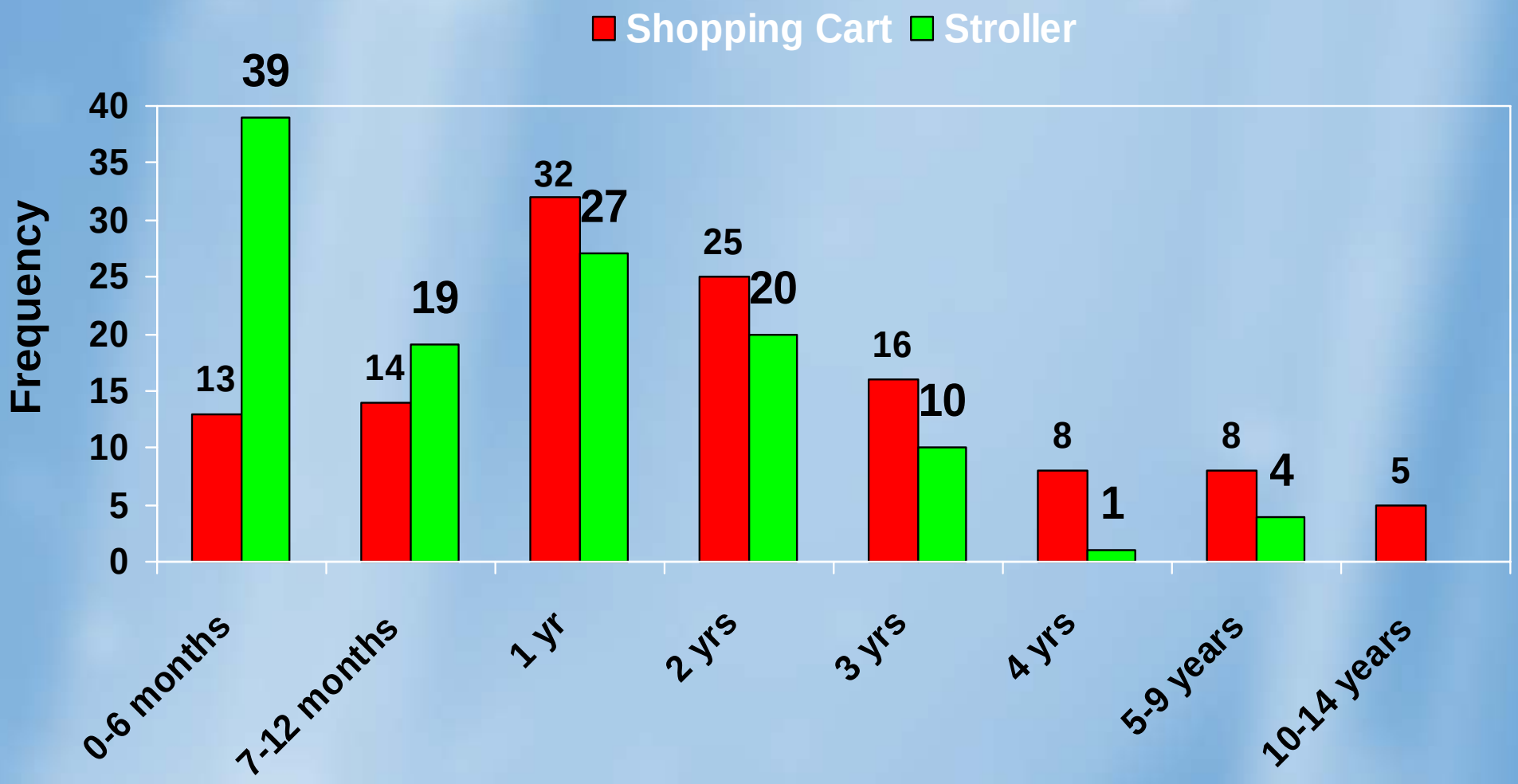
San Diego County Selected Injuries by Circumstance, Ages 0-14, FY99-02



Source: County of San Diego, Health and Human Services Agency, Division of Emergency Medical Services, MICN Database, 1/99-8/02.

Types of Incident by Age

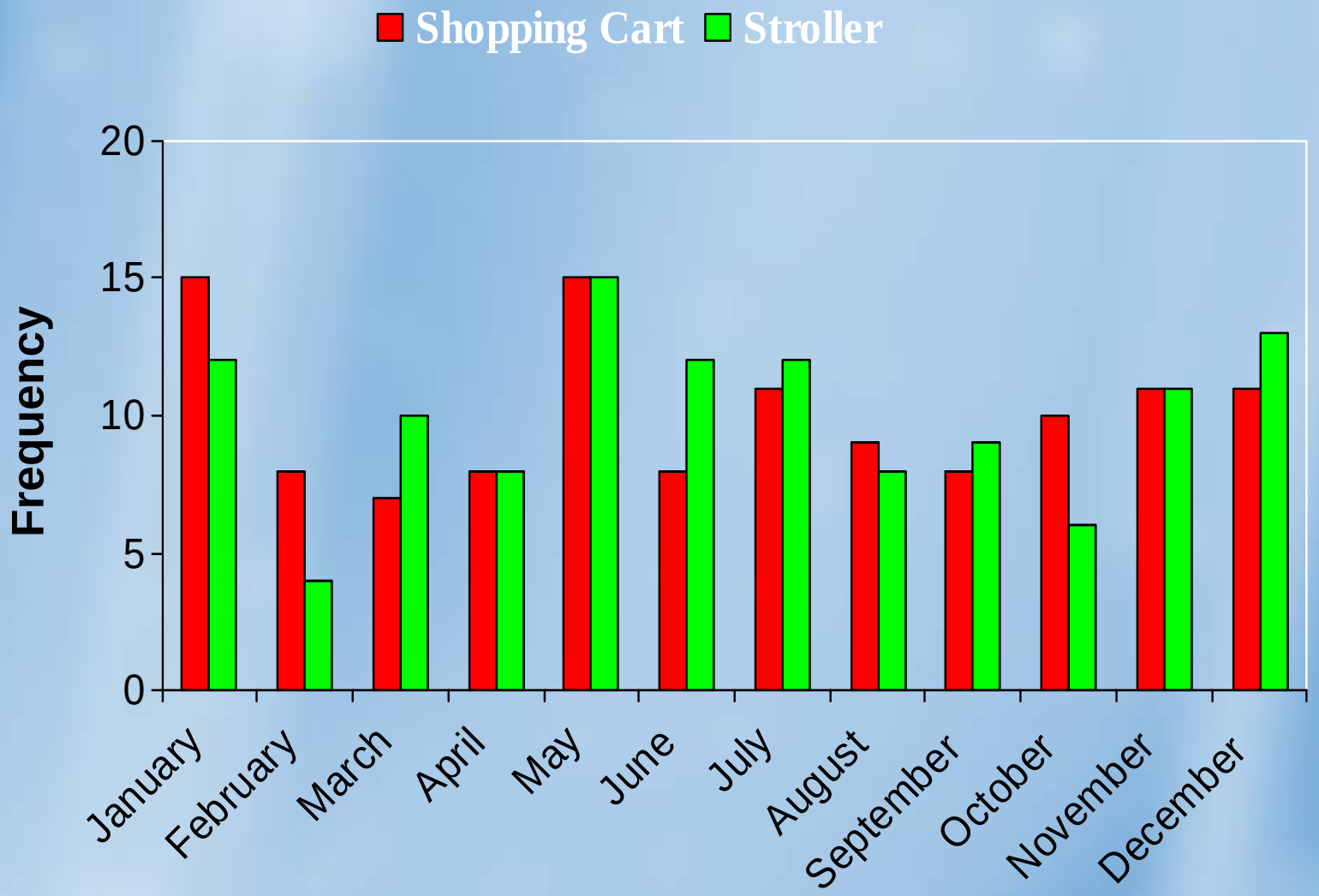
San Diego County Selected Injuries by Age, FY99-02



Source: County of San Diego, Health and Human Services Agency, Division of Emergency Medical Services, MICN Database, 1/99 – 8/02.

Month of Incident

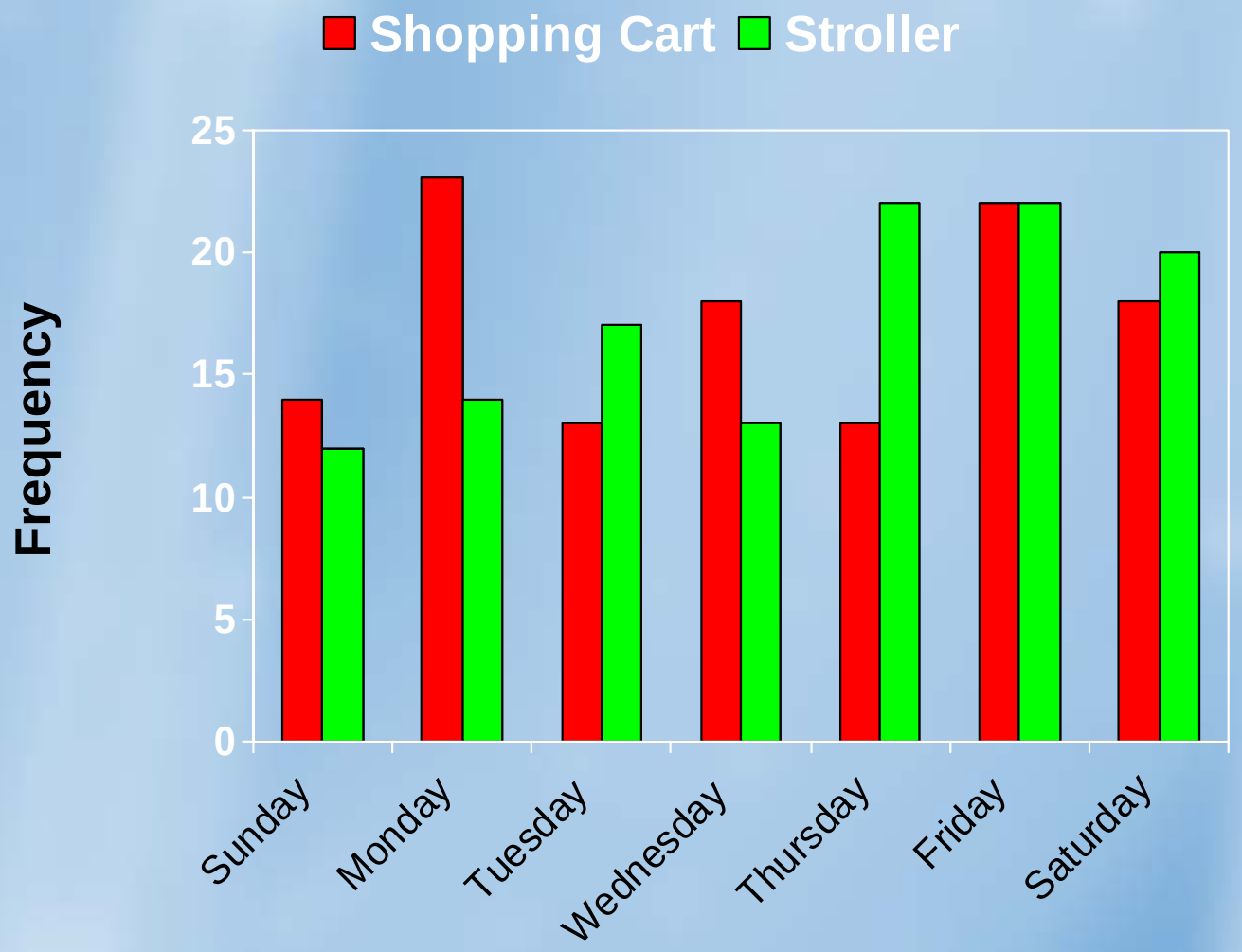
San Diego County Selected Injuries by Month, Ages 0-14, FY99-02



Source: County of San Diego, Health and Human Services Agency, Division of Emergency Medical Services, MICN Database, 1/99-8/02.

Day of Incident

San Diego County Selected Injuries by Day, Ages 0-14, FY99-02



Source: County of San Diego, Health and Human Services Agency, Division of Emergency Medical Services, MICN Database, 1/99-8/02.

When, Where and How Do Shopping Cart and Stroller Injuries Occur

- The majority were head injuries
  - 53% Stroller and 59% shopping cart
- The most injuries occurred during the month of May (12%).
- Friday was the most frequent day of week with lowest being on Sunday
- Of the shopping cart injuries:.
  - <2% of the shopping cart injuries involved moving cars.
  - Most frequently a child fell from the cart to the floor.
- Of the stroller injuries:
  - 13% involved escalators/stairs.
  - 13% involved moving cars or trucks.

Who is at Risk for Shopping Cart and Stroller Injuries

- Very young children and males
- Unrestrained children:
  - Only a few children injured were restrained (when known)
  - No children were reported to be restrained in a shopping cart
- At different ages there tend to be behavior patterns such as squirming, reaching and rough playing that lead to specific types of injuries.
- Unattended children:
  - According to National Safe Kids Campaign, more than 80% of parents/caregivers leave a child unattended at least once while on a shopping trip.

Prevention Tips

- Always use safety belts to restrain your child in a shopping cart or stroller.
  - Consider bringing a harness or safety belt when shopping.
- Always stay close to your shopping cart or stroller.
- Do not let your child stand in your shopping cart or stroller.
- Never let a child push or steer the shopping cart or stroller.
- Carefully watch siblings, many injuries resulted from pushing each other or tipping the cart or stroller over.
- Don’t let your child ride in the bin or under the cart.

Conclusions

- Shopping cart and stroller incidents happen as frequently as other types of injuries that are subject to regulations and receive more public health attention.
- Although most of these shopping cart and stroller injuries were “mild” in status, the potential for severe head/neck injury exists.
- Mild head injuries can have significant and sustained impacts on behavior and ability to learn.
- Most new shopping carts and strollers are manufactured with safety straps, the challenge is to get parents to use them regularly.

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Program Evaluation Made Simple

Why Evaluate?

- Funding requirements
- Improve the process
- Justification
- Documentation
- Accountability

What to Evaluate?

- Instruments
- Questionnaires
- Processes
- Procedures
- Knowledge/Attitudes/Beliefs
- Behaviors
- Outcomes

Stages of Evaluation

Formative Evaluation	Process Evaluation	Impact Evaluation	Outcome Evaluation
•Pilot tests	•Participation	•Knowledge	•Morbidity
•Materials	•Penetration	•Attitudes	•Mortality
•Strategies	•Cost	•Beliefs	
•Messages	•Satisfaction		

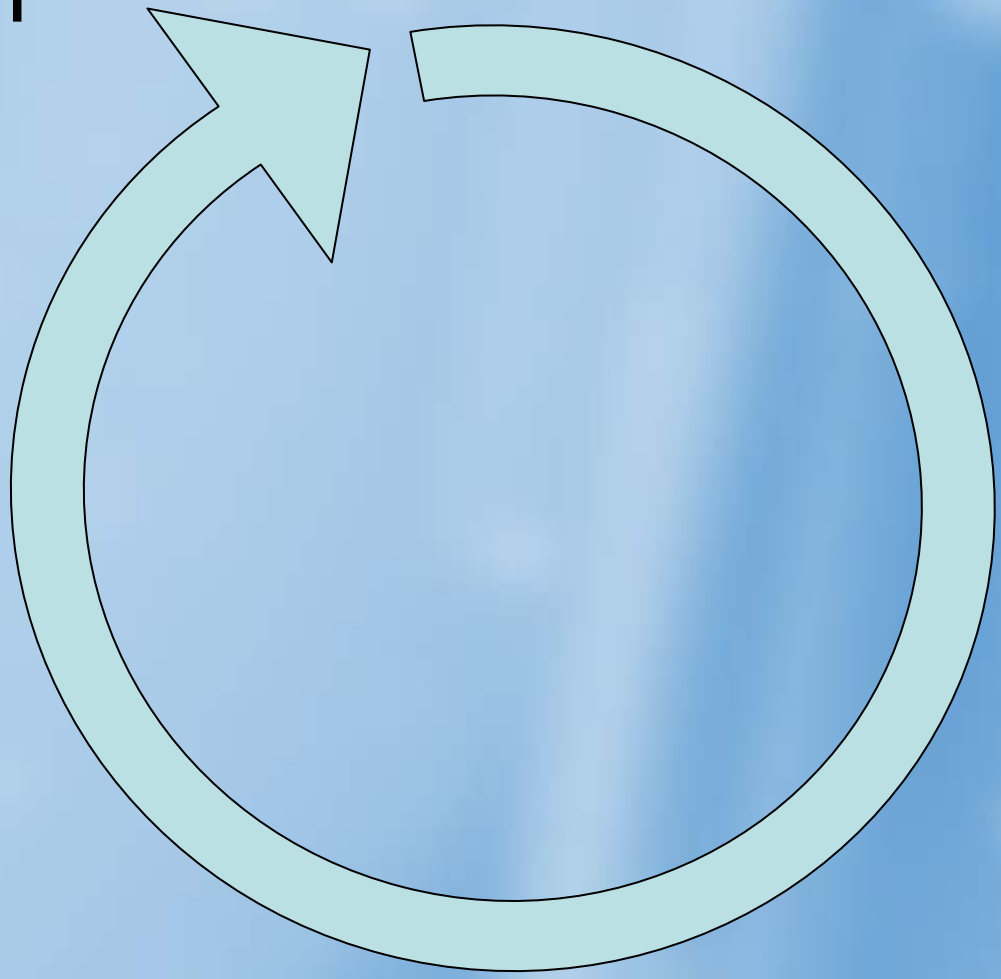
Before Intervention | **During Intervention** | **After Intervention**

Evaluation Planning

- Objective: What is the question?
- Describe the target population
  - Also control group
- Describe type of information to be evaluated
- Choose specific methods
  - Quantitative/qualitative
  - Data collection strategies
- Design and test instruments

Evaluation – completing the cycle

- Collect raw information
- Process data
  - Enter/code/clean data
- Analyze data
  - Frequencies, crosstabs
  - Statistical testing
- Communicate findings
- Revise if needed



Program Evaluation

- For more information on program evaluation:
  www.cdc.gov/eval/framework.htm

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- Data Basics & Definitions
- Finding the Right Data
- Data Measures
  - Choosing
  - Analyzing
  - Interpreting
  - Presenting
- Special Considerations
- Health Indicators
- SMART Objectives
- Project Example
- Program Evaluation

Conclusion

Conclusions

- Data - Definitions
- Asking Questions to Find Data
- Data Measures
  - Choosing, Analyzing, Interpreting, Presenting
- Special Considerations
- Health Indicators
- SMART Objectives
- Program Evaluation

Community Health Statistics Unit

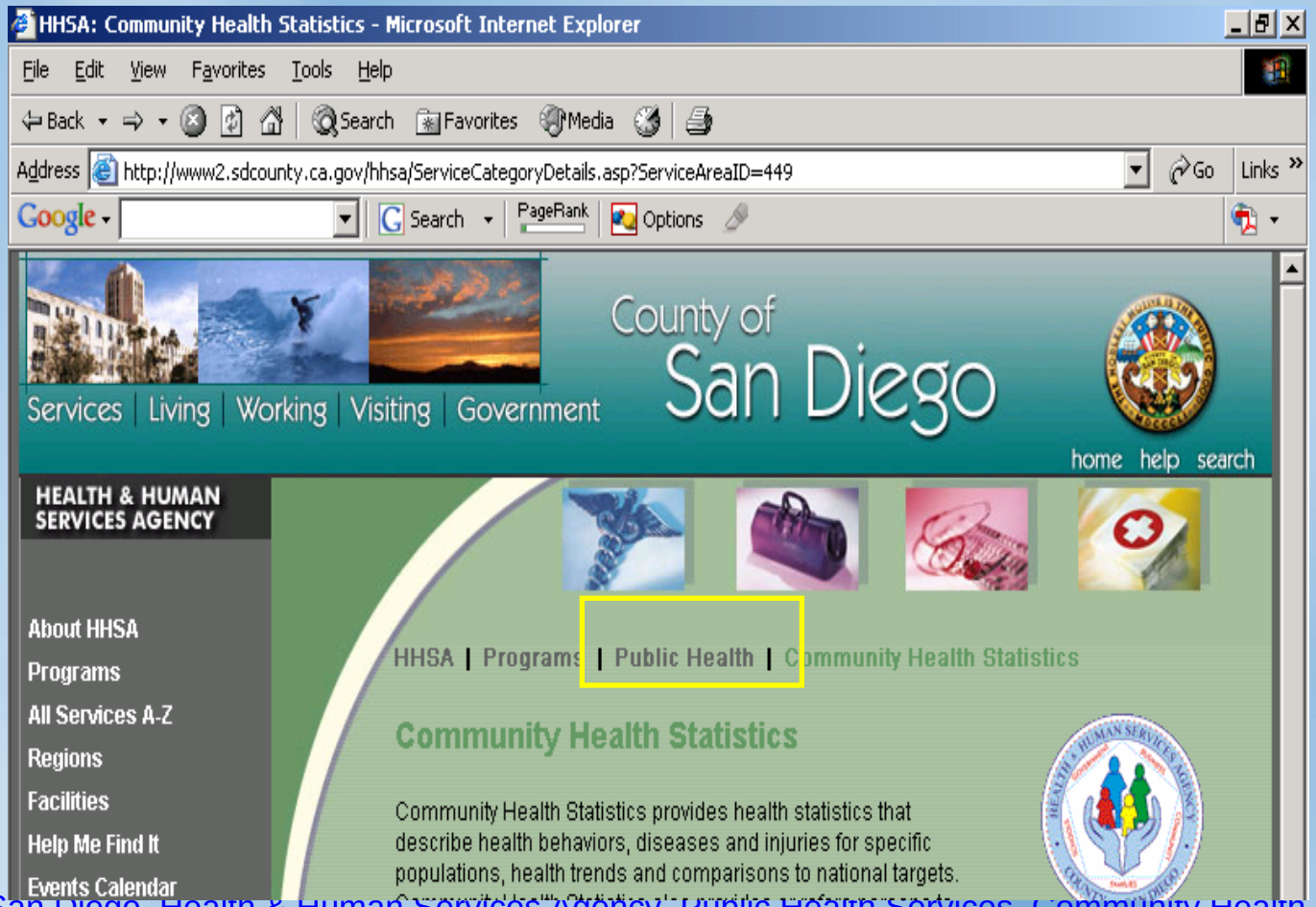
- "One Stop Shop" for health data
- Data Requests (619) 285-6479
- CHS Unit Website:
  - www.sdhealthstatistics.com

Finding Data on the County Website

- All Public Health Services pages (repeat from workshop I)
- Community Health Statistics Unit – Online Community Profiles

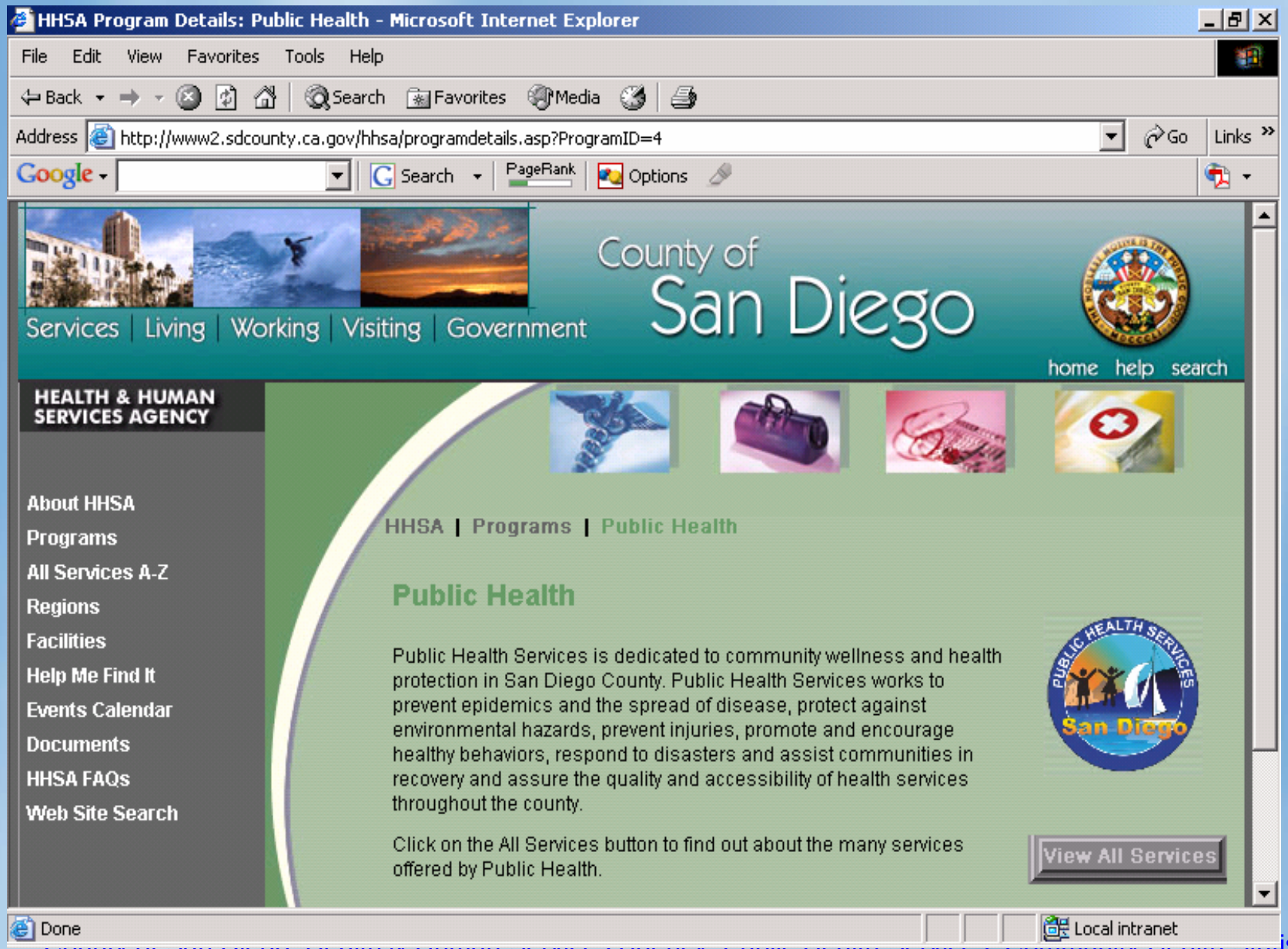
Navigating County of San Diego Web

- Go to your favorite, easy to remember County site
  - i.e. www.sdhealthstatistics.com
- Click on Public Health in grey at top



Navigating County of San Diego Web

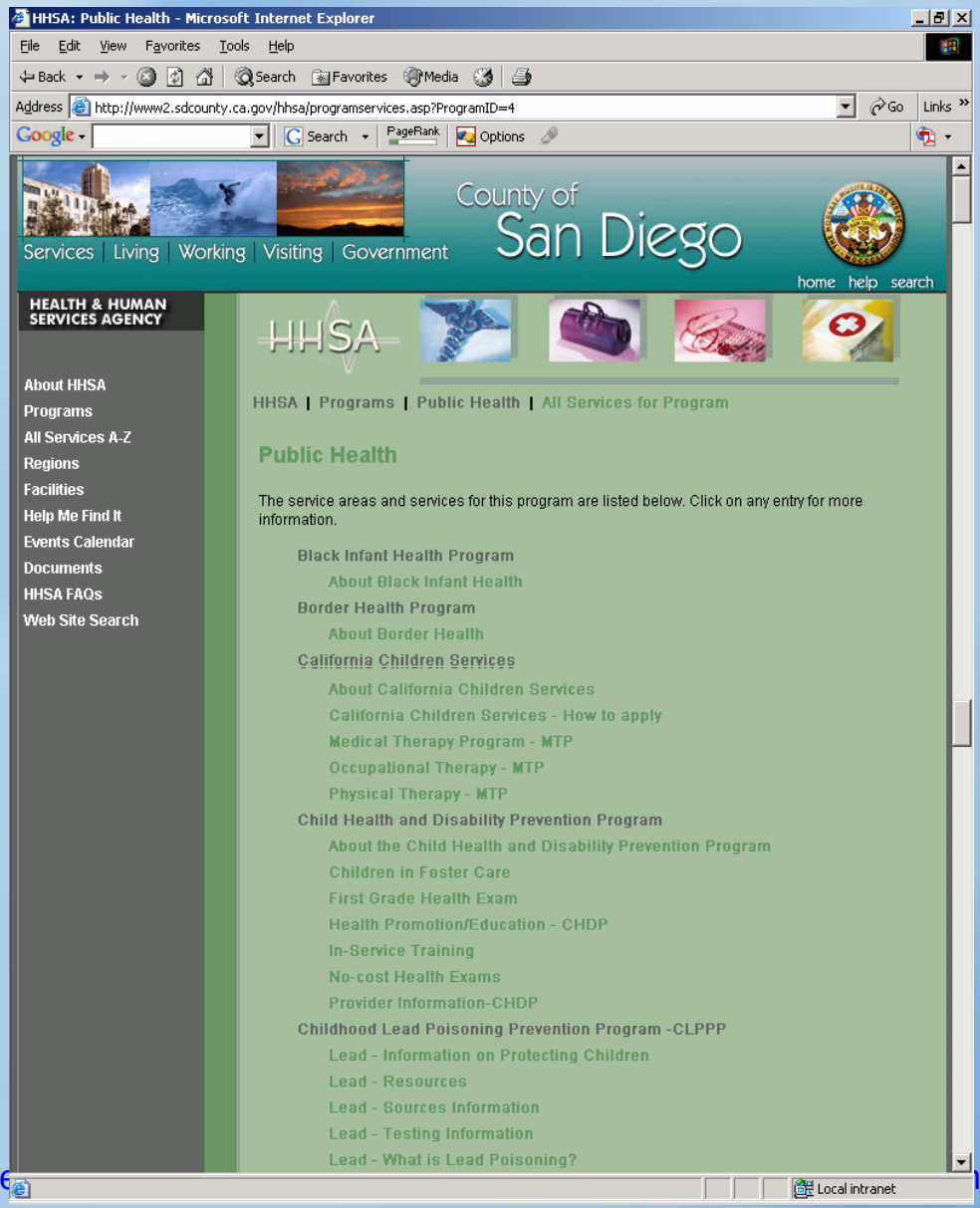
Public Heath Services



Select "View All Services"

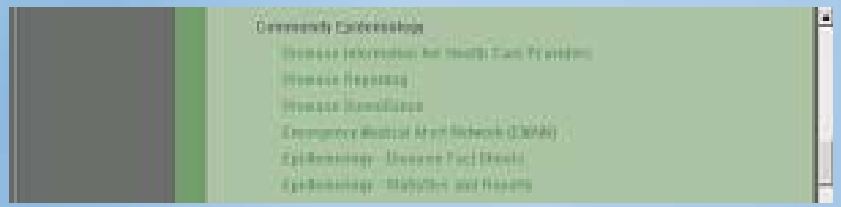
Navigating County of San Diego Web

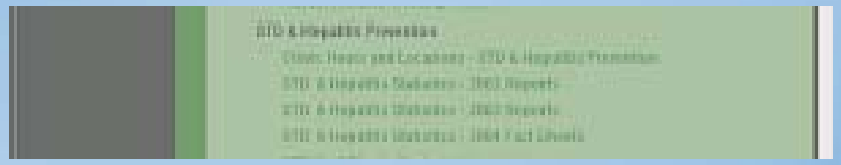
Full listing of all Public Heath Services web pages

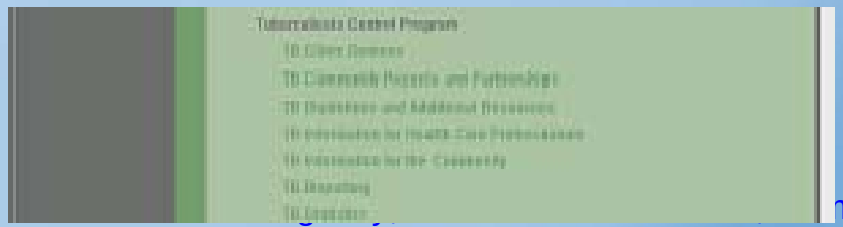


Scroll down to find the webpage you want…

Navigating County of San Diego Web







CHSU Website: Community Profiles

Favorite Place on CHSU Website:

Online Community Profiles!

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Important Information for Data Users

Please Review This Section Before Using the Following Public Health Data

For abbreviations used in data sources, see Data Sources.

Diagnoses:
Disease definitions for most indicators are based on ICD-CM coding. Two versions of ICD coding are used in this document depending upon the data source, ICD-9 or ICD-10. ICD-CM based data for San Diego is comparable whether obtained using the 9th or 10th revision; codes used are listed in footnotes for appropriate tables. Healthy People 2010, USA, California data are shown if available and comparable to local data; definitions for these can be found via Healthy People 2010 Operational Definitions.

The death data used in this document only include underlying cause of death. That means that deaths are categorized only by the disease or injury that initiated the chain of events leading to death and not by the immediate cause or any other contributing causes. For example, a diabetic who died of heart disease resulting from complications of diabetes would only be included among diabetes-related deaths. Similarly, Hospital Discharge and Emergency Department Discharge data is reported by the primary diagnosis at time of discharge for which the medical encounter occurred. In some cases, indicators are based on case definitions; meeting specified clinical and/or laboratory criteria not ICD-CM coding.

Comparing Data:
Caution must be used when exploring data from multiple sources or even the same data prepared by different analysts; comparisons may not be appropriate. Attention to accompanying information is important in order to note differences including, but not limited to: data sources, data preparation, diagnosis/case definitions, rate constant (i.e. per

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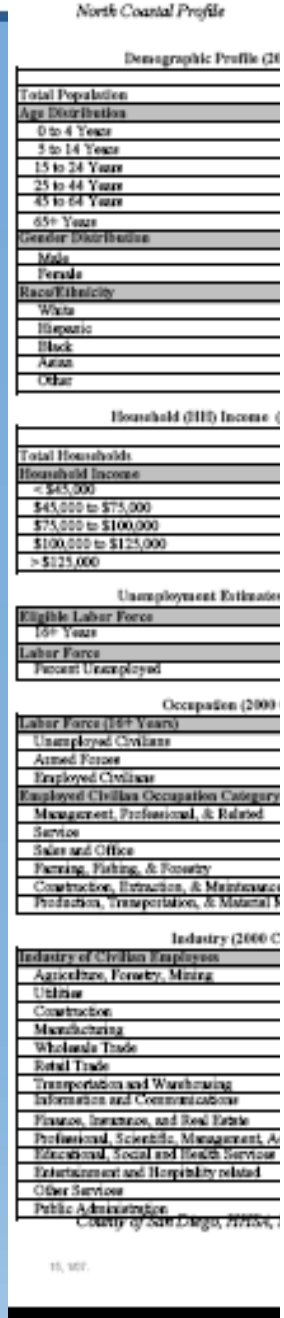
COUNTY OF SAN DIEGO
HEALTH AND HUMAN SERVICES AGENCY
PHS
Public Health Services



North Coastal Profile

North Coastal Region

Demographic Data

Demographic Profile (2006 Estimates)

	Number	Percent
Total Population	93,362	100.00%
Age Distribution		
0 to 4 Years	4,799	5.14%
5 to 14 Years	11,122	11.91%
15 to 24 Years	12,517	13.41%
25 to 44 Years	24,063	25.77%
45 to 64 Years	29,458	31.55%
65+ Years	11,403	12.21%
Gender Distribution		
Male	45,945	49.21%
Female	47,417	50.79%
Race/Ethnicity		
White	72,503	77.66%
Hispanic	14,077	15.08%
Black	621	0.67%
Asian	3,526	3.78%
Other	2,635	2.82%

Household (HH) Income (2006 Estimates)

	Number	Percent
Total Households	173,064	100.00%
Household Income		
< $45,000	66,876	38.64%
$45,000 to $75,000	43,267	25.00%
$75,000 to $100,000	22,931	13.25%
$100,000 to $125,000	14,313	8.27%
> $125,000	25,711	14.86%

Unemployment Estimates (2000 Census)

Eligible Labor Force	
16+ Years	234,467
Labor Force	

Education (2000 Census)

Total Population	
25+ Years Old	284,002
Completed Education	
< High School Graduate	14.93%
High School Graduate	18.77%
Some College or AA	33.91%
Bachelor Degree	20.59%
Graduate Degree	11.80%

School Enrollment (2000 Census)

Population Eligible for Enrollment	
4 to 18 years	98,514
School Enrollment (K - 12)	
Percent Enrolled	90.09%
Private vs Public School Enrollment	
Percent Public Schools	90.45%
Percent Private Schools	9.55%

Language (2000 Census)

Total Population	
5+ Years Old	425,344
Primary Language Spoken at Home	
English Only	73.15%
Spanish Only	6.01%
Asian/Pacific Island Language Only	0.39%
Other Language Only	0.22%
Bilingual	20.22%

Housing Estimates (2000 Census)

Occupancy	
Owner Occupied	60.22%
Renter Occupied	38.87%

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Click on a topic to jump to that page

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San Diego County - Public Health Data

Coronary Heart Disease

Healthy People 2010 Target: 166 heart disease deaths per 100,000 age adjusted population*

USA: 172 deaths per 100,000 age adjusted population (2003)* ‡

California: 178 deaths per 100,000 age adjusted population (2003)* ‡

Death Certificate

Coronary Heart Disease† Deaths Among San Diego County Residents by Location of Residence

	North Coastal		North Central		Central		South		East		North Inland		Unknown§		County		County age-adjusted rate
Year	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	
2000	658	143.1	863	155.3	703	146.4	669	173.6	836	189.2	801	163.2	22	---	4,552	161.8	185.1
2001	693	148.3	780	138.6	651	133.2	648	163.1	881	196.8	831	166.3	28	---	4,512	157.6	178.4
2002	673	139.3	694	120.4	676	138.9	631	153.1	850	188.4	700	137.0	23	---	4,247	145.4	162.9
2003	671	137.3	681	115.1	600	122.9	598	140.4	832	183.8	745	141.9	53	---	4,180	140.7	155.1
2004	630	126.9	696	117.4	605	122.7	589	135.2	725	159.1	723	134.1	51	---	4,019	133.4	144.4
2005		-		-		-		-		-		-		---		-	

* Rates per 100,000 population. Age Adjusted Rates per 100,000 2000 US standard population.

† Coronary Heart Disease death refers to ICD-10 codes I11, I20-I25

‡ Source: National Vital Statistics System, CDC, NCHS. Online database accessed 12/20/06: http://wonder.cdc.gov/data2010/source.htm

§ Rates not calculated for fewer than 5 events. Rates not calculated in cases where the patient's zip code is unknown.

Source: State of CA, DHS, County of San Diego, Health & Human Services Agency, Community Epidemiology, Death Statistical Master Files; SANDAG, Current Population Estimates, 9/27/06.

Prepared by County of San Diego (CoSD), Health & Human Services Agency (HHSA), Community Health Statistics, 12/12/2006.

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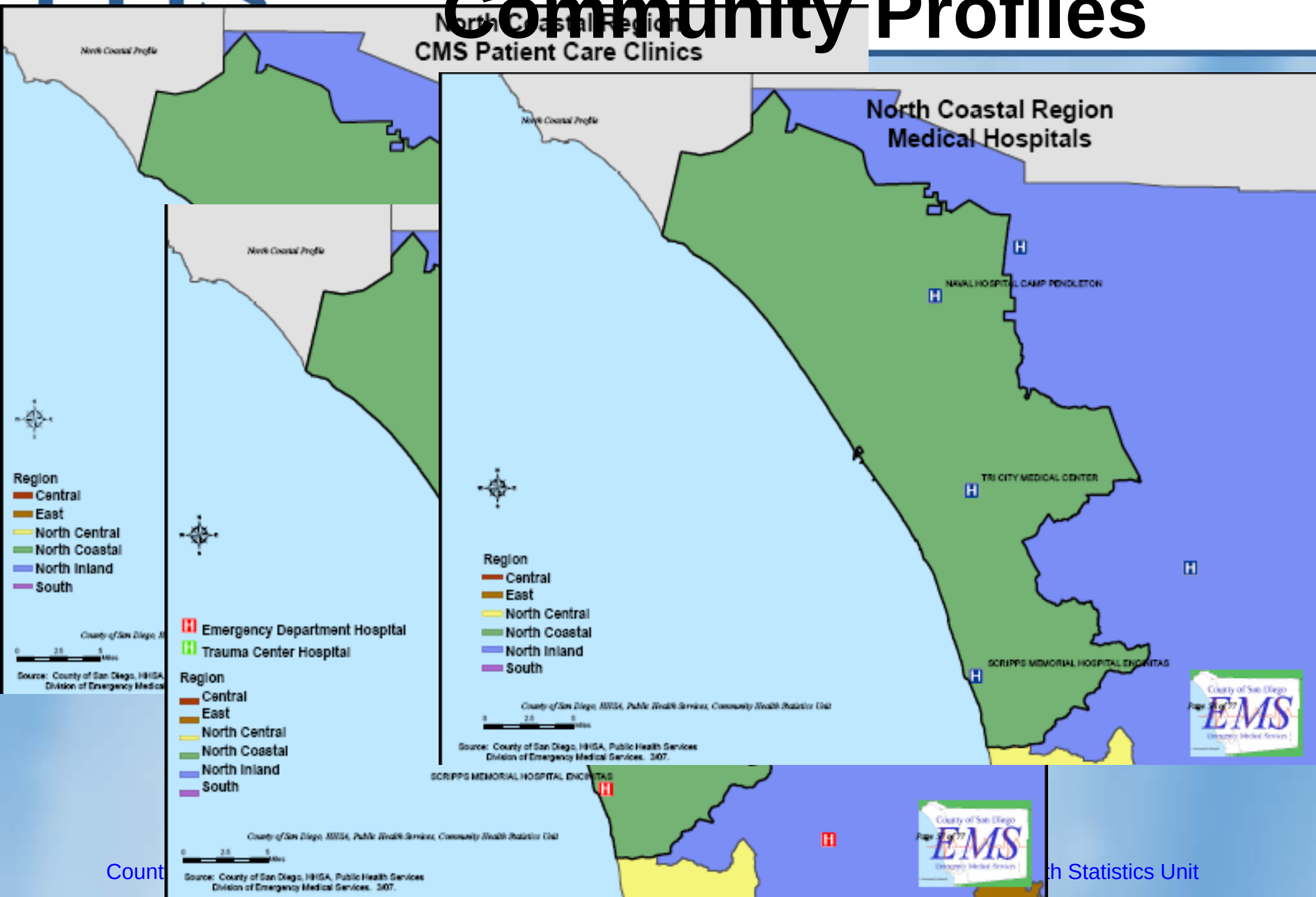

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Future data updates

- Survey data: CHIS, YRBS data
- Other data: air quality, violence
- Maps: Health indicators

Questions?

- Evaluations – please fill out!
- Questions???

Contact Information

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San Diego, CA 92120

www.sdhealthstatistics.com

Data Requests (619) 285-6479